INVESTIGATING THE RELATIONSHIP BETWEEN ENROLLMENT CHARACTERISTICS AND ACADEMIC PERFORMANCE WITH THE EDUCATIONAL OUTCOMES OF FIRST- AND CONTINUING-GENERATION STUDENTS

by

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ABSTRACT

First-generation students in higher education face challenges in terms of access to and graduation from higher education institutions. The purpose of this study was to examine the educational outcomes of graduation, cumulative loan debt, and employment for first-generation students compared to their continuing-generation peers at baccalaureate-granting institutions. Three different definitions of first-generation student are commonly used in practice and in research. Each of these three definitions of first-generation were explored in order to make a recommendation for which definition of first-generation could be used to benefit the greatest number of individuals. The Beginning Postsecondary Student Survey (04:09) was utilized to examine the educational outcomes of first-generation students through descriptive statistics and logistic regression.

This study was examined through the lens of social mobility. Findings revealed that first-generation students graduated with a bachelor's degree at a rate lower than their peers, accumulated debt at equal or greater rates, and attained employment at rates similar to their continuing-generation peers. Students who identified as first-generation and underrepresented in terms of race or ethnicity were less likely than their continuing-generation Caucasian and Asian peers for every definition of first-generation student. First-generation students whose parents did not attend college or who attended some college but did not attain a degree accumulated loan debt at a higher rate than students

whose parents attained a degree or certificate of some sort.

While first-generation students secured employment at comparable salaries and at a similar rate to their continuing-generation peers, which could be viewed as a gain in social mobility, they had higher average amounts of loan debt for each definition of first-generation. To ensure that each first-generation student is getting the assistance that they need in terms of support services and loan counseling, it is recommended that the broadest definition of first-generation, individuals whose parents did not attain a bachelor's degree, be used in research and practice.

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GLOSSARY OF TERMS

Continuing-generation students: those whose parents attended college who may or may not have achieved a college degree as this defintion varies based on the definition of first-generation that is used.

Cultural capital: individuals' knowledge and skills related to higher education and the processes associated with higher education such as admissions and financial aid (Sullivan, 2001).

First-generation definition one: those students whose parents did not attend college.

First-generation definition two: those students whose parents attained less than an associate's degree.

First-generation definition three: those students whose parents graduated with a certificate or an associate's degree but less than a bachelor's degree.

Human capital: an individual's productivity and their ability to earn income and contribute to society.

Social capital: the networks and relationships of which an individual is a part that allow them to gain knowledge of higher education (Helliwell & Putnam, 1999).

Social mobility: the extent to which individuals are able to increase their socioeconomic status and class by hard work, career advancements, and increases in salary (Haveman & Smeeding, 2006).

TRiO programs: federal programs designed to serve underrepresented students in both high school and college.

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CHAPTER I

INTRODUCTION

While the large majority of individuals in the United States do not have a bachelor's degree, educational attainment has increased over the past 3 decades with the number of individuals completing a 4-year degree growing from 22% to 32% (National Center for Education Statistics, 2012). The United States continues to rank highly compared to its international peers with a ranking of 11th overall in terms of credentials for individuals between the ages of 25 and 34; however, in 1990, the United States ranked first (Organisation for Economic Co-operation and Development [OECD], 2013). Although bachelor degree attainment is increasing in terms of actual numbers, in the 10-year period between 2000 and 2010, overall degree completion increased by only 1.3% in the United States compared to an average of 3.7% for all countries represented by the OECD (2013).

Attainment Gap

The overall increase in degree attainment is a promising statistic; however, the gaps between bachelor's degree completion for African American and White individuals and Latino/a and White individuals also increased between 2000 and 2010 by 6% for African Americans and 9% for Latino/a individuals in the United States (NCES, 2012). This shows that while overall completion has increased, White individuals are attaining

postsecondary degrees at a rate higher than Latino/a and African American students and that this gap is expanding over time.

While both the OECD (2013) and NCES illustrated the differential educational outcomes in terms of degree attainment based on ethnicity, there was no available literature on an international scale regarding the achievement gap between first- and continuing-generation students until 2014. Within the OECD literature, first-generation is defined by a student's immigrant status as opposed to their parents' level of degree attainment (OECD, 2013); however, in OECD (2014), degree attainment is explored in terms of parent's education influencing the attainment of their children. OECD found that in the United States, more than 15% of individuals not currently enrolled in postsecondary education had lower levels of educational attainment than their parents (OECD, 2014). However, 32% of individuals in OECD countries had higher levels of educational attainment than their parents, which is likely due to advancements in access to postsecondary institutions, and more than 50% of students in the United States and seven other countries had the same level of educational attainment as their parents (OECD, 2014). The OECD notes that students whose parents have not attained a tertiary (postsecondary) degree are less likely to have the financial backing to attend postsecondary education themselves and that this puts students at a disadvantage when compared to their peers.

While not directly explored in OECD literature, we can begin to explore the relationships between the statistics reported by the NCES and OECD as first-generation students also are more likely to identify as ethnic minority and low-income when compared to their continuing-generation peers (Bui, 2002; Nunez & Cuccaro-Alamin,

1998; Saenz, 2007; Terenzini, Springer, Yaeger, Pascarella, & Nora, 1996). This study focused on the educational outcomes of first-generation students in the United States as opposed to taking a worldwide perspective of educational outcomes because the dataset being used includes only students in the United States; however, it is important to note that the phenomenon of students being the first in their family to attend college is not isolated to the United States.

Within the United States, studies have revealed that first-generation students access college at a lower rate than their peers (Aronson, 2008; Chen & Carroll, 2005; Choy, 2001; Ishintani, 2006; McCarron & Inkelas, 2006; Warburton, Bugarin, & Nuñez, 2001). Six studies examined the degree attainment gap between first-generation and continuing-generation students who enrolled in college, and each study found that first-generation students also graduate at a rate much lower than their continuing-generation peers even with overall graduation statistics in the United States continuing to climb (Cabrera, Burkum, LaNasa, & Bibo, 2012; Chen & Carroll, 2005; Engle & Tinto, 2008; Ishintani, 2006; McCarron & Inkelas, 2006; Warburton, et al., 2001). Filling the graduation gap between first- and continuing-generation students is essential to challenging the social inequities that persist in society today. In order to provide all students the opportunity to earn a degree and be successful in their future careers, institutions must work to close the graduation gap between first- and continuing-generation students. This is especially important as states and the federal government continue to focus on increasing graduation rates and as the United States aims to improve its position in the worldwide market.

Postgraduate Outcomes

The achievement gap between first- and continuing-generation students within the United States raises concern. Research has demonstrated that individuals who attain a bachelor's degree earn on average $1 million more over their lifetime than individuals who identify as high school graduates (Julian, 2012). While this statistic does not consider the student loan debt incurred, studies have shown that loan debt averages much less than $1 million per individual (Campaigne & Hossler, 1998; Engle & Tinto, 2008; Lohfink & Paulsen, 2005; Lundberg, Schreiner, Hovaguimian & Miller, 2007; Somers, Woodhouse, & Cofer, 2004). In addition to earning more over their lifetime, individuals who received a bachelor's degree have an unemployment rate that is 3.8% lower than individuals who achieved a high school diploma in 2012 (Bureau of Labor Statistics, 2013). While each of these statistics was also broken down by race and gender, neither examined whether first- and continuing-generation students benefit at the same rate in terms of postgraduate outcomes. This study examined whether there are differences in educational outcomes for first- and continuing-generation students in the United States after first exploring the characteristics and definitions of first-generation college students.

First-Generation Students in Higher Education

As colleges have grown, so too has demographic diversity and the presence of first-generation students (Pascarella, Pierson, Wolniak, & Terenzini, 2004). Between the years 1992 and 2000, approximately 22% of individuals enrolled in college were first-generation college students (Chen & Carroll, 2005). Engle and Tinto (2008) reported this number to be 24% while Nunez and Cuccaro-Alamin (1998) reported it to be closer to 50%. It is important to note that first-generation is an ambiguous term; a set definition

has not been established (Davis, 2010; Hsiao, 1992). The percentage of first-generation students enrolled can vary greatly based on the sample used, demographic and survey questions asked, and the definition of first-generation applied. Further, these numbers are likely quite different today because the data used in these studies are over 10 years old.

The ambiguity around the definition of first-generation is discussed further in the literature review; however, it is important to note here because it sets the foundation for this study. For the purposes of this study, first-generation college students include those for whom neither parent attended college, those whose parents only attended some college, and those whose parents attained less than a bachelor's degree. Utilizing these broad definitions allows for an examination of whether student outcomes vary by definition used. Another challenge that adds complexity to the analysis is the fact that students who identify as first-generation also tend to identify as both low-income and minority at a rate higher than their continuing-generation peers because first-generation students are the children of parents who have not attained a bachelor's degree and are thus more likely to report lower salaries (Bui, 2002; Nunez & Cuccaro-Alamin, 1998; Saenz, 2007; Terenzini, et al., 1996). To explore these relationships further, this study considered the interactions between the following demographic characteristics: race and ethnicity, household income, and each definition of first-generation status.

Social Mobility

This study is examined through the lens of social mobility theory. Social mobility theory examines the extent to which individuals are able to increase their socioeconomic status and class by hard work, career advancements, and increases in salary (Haveman & Smeeding, 2006). Social mobility can occur when an individual experiences an increase

or decrease in their social class; however, this study explores only positive gains.

Purpose

The purpose of this study was to examine the educational outcomes of first-generation students compared to their continuing-generation peers at baccalaureate-granting institutions. This study also explored whether educational outcomes differ for individuals who identify as first-generation and individuals of color, first-generation and low-income students, and first-generation students identifying as both low-income and as students of color. Educational outcomes included graduation, debt accumulation, and employment status.

Introduction Summary

While advancements have been made in the recruitment and retention of first-generation college students, there is still much work to be done. First-generation students still persist to graduation at a rate lower than that of their continuing-generation peers, and little research has explored the outcomes of these students after graduation. This study will explore the educational outcomes of graduation, debt accumulation, and employment in order to demonstrate whether first-generation college students are employed and carrying debt loads similar to those of their continuing-generation peers.

Providing access to higher education for all students, including first-generation students, is essential; however, we must also ensure that these students are not over burdened by debt upon graduation and that they are able to secure employment. Because first-generation students also tend to report ethnic minority and low-income status, graduation, debt accumulation, and employment are important outcomes to consider. This

can determine whether these students use higher education as a means to a better life and to achieve social mobility. In order to explore these outcomes and frame this study, the next chapter examines research that explores the common characteristics of first-generation students and how the concepts of graduation, debt, and employment of first-generation college students have been considered in the past.

CHAPTER II

LITERATURE REVIEW

This literature review is comprised of research related to educational outcomes or success indicators for first-generation students. This study examined information related to how first-generation and continuing-generation students compare in terms of achievement of educational outcomes (i.e., graduation from a 4-year institution, the amount of debt accumulated at the time of graduation, and the rate at which students are employed with comparable initial salaries). Before discussing these topics, the literature frames the history of racism and classism in higher education and how legislation has impacted first-generation students. Next, how individuals are included in the first-generation student category is explored along with common characteristics attributed to first-generation students. The review then addresses the postgraduate outcomes of graduation, debt accumulation, and employment. Finally, I discuss how the studies cited in the literature review can be refined in future research and identify gaps in the research around first-generation students and their continuing-generation peers.

Racism and Classism in Higher Education

Racism and classism have been present in the United States since colonization first began. Challenges associated with racism and classism have not diminished over time; rather, these challenges have been carried over hundreds of years with occasional

fluctuations in the intensity of the issues surrounding race and class. While these concepts are not new or surprising, they are important to discuss in this literature review, specifically in regard to their presence in the higher education setting.

Historically, racially and ethnically underrepresented groups have been excluded from the higher educational setting (Chesler, Lewis, & Crowfoot, 2005). With the initial creation of the American public school system, White students were the only students who were included in education, and often only wealthy White men (Chelser, et al., 2005). This situation improved slightly as public schooling moved toward segregation and the belief that while education was to be provided separately, it would still be provided equally (Ferguson, 1867). In the 20th century, schools moved toward integration and equality rather than exclusion and segregation, although these principles have not yet been truly achieved. School quality still varies by geographic location with factors of wealth impacting the quality of education (Orr, 2003). To this day, students who live in less affluent communities have a different racial makeup and different educational opportunities provided to them than individuals in wealthier communities (Mortenson, 2000).

Institutions of higher education have experienced an evolution of inclusion similar to the secondary school setting. Postsecondary education was originally established largely to train White clergymen (Thelin, 2003). This educational purpose expanded over time to include a liberal education and eventually to train individuals for a wide variety of careers (Thelin, 2003). However, because higher education was originally established for privileged, White men, the path to inclusion and access was traveled slowly. In fact, it was uncommon for individuals of color to attend higher education prior to World War II,

with the exception of Black Colleges and Universities (Chesler, et al. 2005; Thelin, 2003). A few institutions such as Antioch and Oberlin Colleges admitted African Americans, but the large majority of institutions of higher education were exclusionary in nature (Chesler, et al., 2005).

Government initiatives ultimately encouraged higher education institutions to be more inclusive with the passage of the Government Issue (GI) Bill in 1944, which provided veterans of every race and ethnicity the opportunity to attend college (United States Department of Veterans Affairs, 2013). Educational improvements seen with the Civil Rights Act in 1964, the creation of the first tribal college in 1968, the Economic Opportunity Act in 1964, and the Higher Education Act in 1965 followed this. The Equal Educational Opportunity Act of 1974 outlawed discrimination and segregation in public schools (Chesler, et al., 2005; Thelin, 2003). These bills advanced access and opportunity for individuals in both secondary and postsecondary education; however, there is still work needed to ensure that educational settings are inclusive and embrace equity.

While higher education is more inclusive today than it has been in the past, inequity is still present. Individuals who are from middle or lower income quartiles and those from minority backgrounds do not have the same level of what is often referred to as cultural capital or knowledge about the college application and admission processes compared to individuals from more privileged backgrounds (Reay, Davies, David, & Ball, 2001). The combination of being both low-income and racially or ethnically underrepresented represents what Crenshaw (1989) coined as intersectionality.

Intersectionality is used to describe the situation for students who experience multiple forms of oppression or are a part of multiple underrepresented groups. For

purposes of this study, these groups include race, class, and first-generation status (Crenshaw, 1989). While class is not always considered an identity, Archer, Hutchings, and Ross (2005) and Delgado and Stefancic (2012) noted that structural inequalities such as class are also an important factor to consider in how they interact with race, gender, sexuality, and other identities. Because individuals are members of multiple groups, it is important to consider the interaction between each of their identities in research as one is not and cannot be present without the other (Block & Corona, 2014; Cole, 2009).

There is much conversation surrounding the idea that race, class, and other identities are socially constructed (Archer, et al., 2005). This means that even if students share the same exact identity in terms of color, gender, generational status, and class, their experiences may be completely different depending on the social, cultural, and historical setting in which they experience these identities. This study attempted to explore these intersecting identities and their impact on the educational outcomes of first-generation students. The identities were first considered separately in the models. Then, intersectionality between the identities of race and ethnicity, income, and first-generation status was examined in nine interaction models exploring the three educational outcomes of graduation, cumulative loan debt, and employment. However, even while studying these intersecting identities through an interaction variable, it is not possible to fully understand the concept of socially constructed identities or the impact of lived experiences of individuals without additional qualitative research.

History of First-Generation Status in Legislation

Federal programs aimed at increasing the success of underrepresented students have been in place since President Lyndon B. Johnson signed the Educational

Opportunity Act in 1964, an important advancement noted above. While the signing of this act established TRiO programs (i.e., federal programs designed to serve underrepresented students in both high school and college), the initial legislation did not include a provision to include students whose parents did not have a college education (McElroy & Armesto, 1998). First-generation status was not a criterion of being involved in TRiO programs until the 1980 Higher Education Act reauthorization when the legislation was broadened to include students who were the first in their family to pursue higher education as a group for which targeted interventions should be provided (McElroy & Armesto, 1998). By including this provision, TRiO programs grew to encompass a broader constituency of educationally disadvantaged individuals. In fact, legislation now requires that two thirds of individuals served by federal TRiO programs must identify as low-income and live in a home where neither parent received a bachelor's degree (Council for Opportunity in Education, n.d.). Over the last 3 decades, research exploring the impact of parental education on educational achievement has grown. With this growth, the profile of first-generation college students has also expanded.

Defining First-Generation Students

In order to study first-generation students in higher education, it must first be acknowledged that there is no concrete definition of what constitutes a first-generation student. This concept has been addressed in the literature for over 2 decades and authors have discussed the lack of common terminology (Davis, 2010; Hsiao, 1992). Three definitions are regularly used: neither parent having enrolled in college (Amelink, 2005; Hirudayaraj, 2011; Horn & Nuñez 2000; Inman & Mayes, 1999; Ishintani, 2006; Lohfink

& Paulsen, 2005; McCarron & Inkelas, 2006; Nuñez & Cuccaro-Alamin, 1998; Saenz, 2007; Somers, Woodhouse, & Cofer, 2004; Warburton, et al., 2001); neither parent having completed any degree (Lundberg, et al., 2007; Martinez, Sher, Krull, & Wood, 2009); and neither parent completing a bachelor's degree (Engle & Tinto, 2008; United States Department of Education [USDOE], 1998). The most inclusive definition includes those individuals for whom neither parent has earned a bachelor's degree. While this is not the most common definition cited in the literature, this is the definition used by TRiO programs, which are funded by the federal government to assist first-generation, low-income, and ethnic minority students in pursuing postsecondary education (USDOE, 1998).

With three definitions varying considerably, studies generalizing their findings to the entire first-generation population could be incongruent, as researchers do not always include the same students in their sample population. Thus, recommendations based on the findings of studies examining first-generation students may inaccurately inform policies that impact these students.

Some studies (Bui, 2002; Chen & Carroll, 2005; Pascarella, et al., 2004; Soria & Gorny, 2012) considered all three definitions when examining first-generation students and parental education levels. Each of these studies, with the exception of Soria and Gorny, found differences between the three definitions in terms of the outcomes examined. Soria and Gorny found that using different definitions of first-generation students did not lead to differential outcomes. They found that regardless of the definition used, statistically significant differences in demographics, academic preparation, and academic and student outcomes remained between students identified as first-generation

and their continuing-generation peers. However, there were also unique characteristics within the different definitions of first-generation including income, academic preparation, and outcomes. Soria and Gorny concluded that differences would remain between first-generation and continuing-generation students no matter what definition is used; however, there are also differences within first-generation students depending on the degree attainment level of parents. The authors recommended that more research take place to further observe these differences.

Similar to the findings of Soria and Gorny (2012), Bui (2002) found that individuals whose parents did not attend college were more likely to be ethnic minorities, more likely to speak English as a second language, and more likely to be low-income than their peers whose parents had some college. The findings of Chen and Carroll (2005) mirrored those of Bui regarding race and income status. Chen and Carroll and Pascarella et al. (2004) also noted that students whose parents had some college earned more credits in the first year than their peers whose parents had never attended college. This pattern continued with withdrawal from courses and average GPA where students whose parents had never attended college had lower levels of success than their peers whose parents had attended or graduated college (Chen & Carroll, 2004). It was also reported that students whose parents had not attended college were less likely to graduate with a bachelor's degree; however, when considering attainment of any postsecondary credential or enrollment in college rather than graduation with a bachelor's degree, there was no significant difference between students whose parents attended college and those whose parents did not (Chen & Carroll, 2004). Thus, students whose parents never attended college fared just as well as students with parents who had some college.

Pascarella et al. (2004) found that students whose parents did not attend college attended less selective institutions with the greatest differences between these students and students whose parents attained a bachelor's degree. Students whose parents did not attend college were also less likely than their peers to be involved on campus (Pascarella, et al.). In each of the findings in the Pascarella et al. study, the greatest differences were reported between students whose parents never attended college and those whose parents attained a bachelor's degree. Each study examined a different set of variables with the exception of demographic characteristics and bachelor's degree attainment, which were each examined in more than one study. Replicating prior research would be helpful in determining whether these findings are consistent over time.

It is interesting to note that the studies considering different definitions of first-generation students included both self-reported and direct indicators of success, so both perception and actual data were accounted for in the differences discussed (Bui, 2002; Chen & Carroll, 2005; Pascarella, et al., 2004; Soria & Gorny, 2012). This study used both of these types of data from the Beginning Postsecondary Survey. This lends validity to the findings if differences between outcomes remain regardless of whether data were gathered using direct or indirect measures. With the exception of bachelor's degree completion, the educational outcomes of debt and employment, which were examined in this study, were not examined in any of the studies reviewed. This study examined whether the differences described in the work of Bui (2002), Chen and Carroll (2005), Pascarella, et al. (2004), and Soria and Gorny (2012) are still evident after students graduate from postsecondary education.

In addition, because of contradictory findings in the research regarding the use of

a specific definition of first-generation, the three definitions of first-generation students were important variables considered in this study. Including such variables allowed for comparison of additional findings regarding graduation from postsecondary education with the findings of prior studies (Bui, 2002; Chen & Carroll, 2005; Pike & Kuh, 2005; Soria & Gorny, 2012), and findings in this study confirmed the large differences in bachelor's degree attainment for first-generation students.

Characteristics of First-Generation Students

Researchers identified a host of characteristics specific to first-generation college students in many studies that considered first-generation students from different perspectives, including demographic characteristics, academic performance, college seeking behaviors, and enrollment characteristics. In addition to background and academic variables, authors have also examined characteristics such as aspirations and self-reported abilities. However, as mentioned above, the characteristics identified below are generalized to all first-generation students even though the cited studies do not necessarily define first-generation status in the same way.

Background Characteristics

In addition to identifying as first-generation, many first-generation students also belong to underrepresented racial and ethnic groups to ethnic minority groups and/or are from low-income households (Bui, 2002; Horn & Nunez, 2000; Nunez & Cuccaro-Alamin, 1998; Saenz, 2007; Terenzini, et al., 1996). Examining first-generation students through the lens of social mobility provided one perspective on whether these students with intersecting identities achieved social mobility insofar as degree completion allowed

for employment at the time of graduation. In addition to having these intersecting identities of first-generation status, underrepresented race and ethnicity, and low-income status, first-generation students who enroll in college tend to be are more likely than their peers to speak English as a second language (Inman & Mayes; Phillippe & Valiga, 2000).

Academic Performance

Saenz et al. (2007) reported that first-generation students spend less time studying in high school, have lower high school GPAs, rate their math and writing ability lower than their continuing-generation peers, and have lower degree aspirations. These statistics align with the fact that first-generation students have already overcome many challenges before they step foot on a college campus because they often come from low-income families who are likely to live in less affluent geographic areas and attend schools that have fewer resources. Chen and Carroll (2005) found that 55% of first-generation students enroll in remedial coursework upon entering college, which can be attributed to lower math and writing skills and lower college entrance test scores. First-generation students often have lower 1st-year college GPAs than their continuing-generation peers (Amelink, 2005; Chen & Carroll, 2005), which is consistent with prior research noting that lower high school GPAs generally equate to lower GPAs in college (Kuh, Kinzie, Buckley, Bridges, & Hayek, 2006). This provides an opportunity for colleges to implement support systems for students in their first year to provide study skills resources, tutoring, and other support services to ensure the success of these and other students.

Mehta, Newbold, and O'Rourke (2011) stated that first-generation students often have financial commitments above and beyond paying for college, such as responsibility

for supplementing their family's income or raising a family of their own. This aligns with an earlier study (Inman & Mayes, 1999), which reported that first-generation students enrolled in college are, on average, older than their peers. Engle and Tinto (2008) also noted that first-generation students were over four times more likely to drop out of college after the first year compared to their continuing-generation peers. This is likely due to added responsibilities associated with having families and working longer hours than their continuing-generation peers. This does not mean that these students are not returning to achieve their degrees at some point. It just means that it may take them longer than the 6 years typically used when calculating graduation rates to complete their degree program. However, Choy (2001) noted that the phenomenon of first-generation students dropping out of college after their first year is not present in the community college setting, which may be because of their flexible class times.

College Seeking Behavior and Enrollment Characteristics

First-generation students are more likely than continuing-generation students to report that the reason they are attending college is the encouragement of their parents (Saenz, et al., 2007). This is very exciting for first-generation students as their parents did not attend or complete college. However, with the additional responsibilities these students manage because of their tendency to also report lower incomes, ethnic minority status, and longer work hours, first-generation students often face an uphill battle in pursuing postsecondary education (Bui, 2002; Horn & Nunez, 2000; Nunez & Cuccaro-Alamin, 1998; Saenz, 2007; Terenzini, et al., 1996).

While first-generation students receive a high level of parental encouragement to attend college, they enroll in institutions at a rate significantly lower than their

continuing-generation peers and persist at lower rates than their peers after enrollment (Choy, 2001). This is likely due to first-generation students being less aware of the opportunities available for financial aid and less knowledgeable overall regarding the college experience because their parents have not attained a degree to gain such cultural capital (McCarron & Inkelas, 2006; Pascarella, et al., 2004). This is absolutely not the case for all students; however, it may be a reality for many students. Continuing-generation students may understand the culture of education to a greater extent, as well as the long-term benefits of education in terms of increased socioeconomic status, while first-generation students may struggle because they have a lower level of exposure to college-educated role models. This puts greater responsibility on institutions of higher education to implement mechanisms that support all students at a level that allows them to be successful.

First-generation students who do enroll in college have a greater presence in community colleges when compared to their continuing-generation peers (Inman & Mayes, 1999; NCES, 2005; Phillippe & Valiga, 2000). In fact, Phillippe and Valiga (2000) reported that over half of all students enrolled in community colleges identify as first-generation. One reason for increased enrollment in community colleges for this group of students is that community colleges have lower tuition costs than 4-year institutions, and first-generation students often come from lower income families (Inman & Mayes, 1999; Pascarella, et al., 2004; Saenz, 2007). Increased enrollment in community colleges may also be because these institutions are most often open enrollment, which would allow for all students, even those with lower levels of academic preparedness, to have access to higher education.

Saenz (2007) discovered that the number of first-generation students enrolled in college full time declined over the 30 years examined in his study. This is especially interesting considering the findings of Fike and Fike (2008) that the greater the number of hours enrolled in the first semester by first-generation students, the higher the likelihood that students will persist into the second semester. First-generation students also report working more than 20 hours a week (Inman & Mayes, 1999; Mehta, et al, 2011; Saenz, 2007), which is likely why they enroll in fewer credit hours. Working a greater number of hours than continuing-generation students is expected because first-generation students are more likely than their peers to come from lower socioeconomic backgrounds and to work to pay for their education (Inman & Mayes, 1999; Pascarella, et al., 2004; Saenz, 2007).

Although many studies identified the same salient characteristics of first-generation students, almost all included unique findings, which means that there was variation in the samples and/or that some authors considered variables that others did not. Most studies reported that first-generation students worked more hours (Inman & Mayes, 1999; Mehta, et al, 2011; Saenz, 2007), had less high school preparation (Kuh, et al., 2006; Saenz, 2007), and enrolled in fewer college credit hours (Fike & Fike, 2008; Saenz, 2007) than their continuing-generation peers. Independent variables related to each of these findings were included in this study. Family income and ethnic minority status were considered in the analysis of the educational outcomes of first-generation students because they were specifically explored in studies that were similar to this study and because there is extensive crossover between these three groups (Bui, 2002; Horn & Nunez, 2000; Nunez & Cuccaro-Alamin, 1998; Saenz, 2007; Terenzini, et al., 1996).

Educational Outcomes

While many studies have determined that first-generation students access and persist in postsecondary education at a rate lower than that of their peers, there is limited research exploring the outcomes of first-generation students who do persist to graduation (Burdman, 2005; Lohfink & Paulsen, 2005; Pike & Kuh, 2005; Somers, et al., 2004; Terenzini, et al., 1996). This study considered three educational outcomes for first- and continuing-generation students: graduation from a 4-year institution, debt accumulated at the time of graduation, and the rate at which students are employed with comparable initial salaries. With the exception of graduation, there has been very limited research comparing the rate at which first- and continuing-generation students vary in terms of debt accumulation and employment after college. Because of this, this study fills an identified gap in the literature.

Graduation

Cabrera, Burkum, LaNasa, and Bibo (2012), Chen and Carroll (2005), Engle and Tinto (2008), Ishintani (2006), McCarron and Inkelas (2006), and Warburton, et al. (2001) each considered the outcome of college completion and used datasets provided through the National Center for Education Statistics (NCES) in their study. Although each study used NCES data for data mining, some authors used different surveys or survey subsets, and each reported that first-generation students have lower success rates in terms of graduation when compared to their peers. Specific findings related to why first-generation students graduated at lower rates than their continuing-generation peers varied between studies as did the percentage differences between first- and continuing-generation student graduation rates. The findings are different due to varying

combinations of independent variables used in each model. While each study examining first-generation student graduation included unique combinations of variables, the researchers also coded the independent variables that they included in different ways. This led the researchers to report contrasting results in the specific differences in graduation between groups and the different factors leading to the reported attainment gap. These varying findings are one of the challenges of predictive modeling because important variables can be left out, which causes omitted variable bias. The researchers can include too many variables, which causes a linear relationship between some variables. Because of these challenges, each study is discussed separately below.

In their examination of first-generation student graduation, Chen and Carroll (2005) found that 24% of first-generation students and 68% of continuing-generation students attained bachelor's degrees by the end of their 8-year study. While ethnicity was not related to graduation for first-generation students in the Chen and Carroll (2005) study, this may be because of omitted variable bias such as not including income or minority status. Often first-generation individuals also identify as belonging to underrepresented racial or ethnic groups and have low household incomes (Bui, 2002; Horn & Nunez, 2000; Nunez & Cuccaro-Alamin, 1998; Saenz, 2007; Terenzini, et al., 1996). An investigation of the interaction between first-generation and ethnic minority group membership might have illuminated this relationship to a greater extent. In addition, financial aid and outside responsibilities such as having children, number of hours worked, and marriage were not included as variables. The inclusion of such variables may have further explained the variance Chen and Carroll found in graduation rates for first-generation students.

Cabrera, et al. (2012) examined degree attainment for low-income individuals and found that bachelor degree completion was most impacted by socioeconomic status, rigorous high school curriculum, degree aspirations, and when students enrolled in college (e.g., right after high school). Completion was also linked with students taking college math and science courses, receiving financial aid, and having children. This study did not consider first-generation status as a variable, which could have provided greater insight into how students' background characteristics impacted completion; however, it is important to note that the variables of children and receiving financial aid were included and did appear to be significant in this study. Children were negatively associated with degree completion and financial aid (both loans and grants) was positively associated with degree completion, which further validates that the Chen and Carroll study may have benefitted from the inclusion of such a variable.

McCarron and Inkelas (2006) used the same data instrument as Chen and Carroll (2005), the National Educational Longitudinal Study (NELS: 88/2000), but examined different variables. The primary goal of this study was to examine the relationship between individual degree aspirations, parental involvement and encouragement to pursue postsecondary education, and bachelor degree attainment among first-generation students. The authors found that the aspirations of first-generation students were disconnected from their actual completion rates, as a higher percentage of first-generation students aspired to complete a bachelor's degree than actually completed, while continuing-generation students attained bachelor's degrees at a higher rate than their initial aspirations suggested. In addition, low-income, first-generation students attained a bachelor's degree at a lower rate than first-generation students at higher income levels

and Latino/a and African American first-generation students completed degrees at rates lower than those for Asian American and White first-generation students. The findings of Ishintani (2006) mirrored those of McCarron and Inkelas with race and income as significant factors in graduation rates of first-generation students. Because of these findings, it was important to examine the interactions between first-generation status, race, and income status in the study reported here.

When examining the limitations of their study, McCarron and Inkelas (2006) reported that they did not include whether a sibling had attained a degree, which could increase cultural capital in terms of awareness of and knowledge about college for first-generation students. While this was an interesting limitation to note, sibling educational achievement is not a variable captured in current national surveys. This limitation in itself could inform revisions to national longitudinal surveys in the future.

Engle and Tinto (2008) examined first-generation students who were also low-income, those who identified as either low-income or first-generation, and those who identified as neither. Despite disaggregating students into whether they were first-generation or low-income, Engle and Tinto still found differences in the graduation outcomes between students who identified as first-generation or low socioeconomic status (SES) and students who identified as neither first-generation nor low-income. However, the differences were even greater between students identifying as neither versus those identifying as first-generation and low-income. These findings reveal that students who identify as both low-income and first-generation face even greater barriers than individuals who identify with only one of those categories.

Although there is a large gap between the graduation rates of first- and

continuing-generation students, Warburton, et al. (2001) found that if the analysis included a variable accounting for rigorous preparation in high school, the graduation gap narrowed substantially. While this is an intriguing finding, it also may be accounted for by the fact that the large majority of first-generation students are also low-income (Inman & Mayes, 1999; Pascarella, et al., 2004; Saenz, 2007). Because low-income individuals often attend schools with fewer resources and advanced placement courses (Kuh, et al., 2006), both class and first-generation status limit their opportunities to enroll in a rigorous high school curriculum.

Martinez, et al. (2009) conducted a single institution study and discovered that first-generation students dropped out of college at a higher rate than their peers, especially when first-generation status was coupled with lower cumulative GPA. Mental health and academic challenges were predictors of drop out as individual variables unrelated to first-generation status. This was the first study in which mental health was considered as an indicator in a study examining first-generation status. Additionally, while the large majority of the studies reviewed used one or more ordinary least squares or logistic regression models (Cabrera, et al., 2012; Chen & Carroll, 2005; Ishintani, 2006; McCarron & Inkelas, 2006; Warburton, et al., 2001), Martinez, et al. used a different regression approach: event history analysis. These authors determined that event history analysis was most appropriate for longitudinal data because it considers the time leading up to when a specific event occurred. Their dependent variable was the point at which students were no longer enrolled as opposed to when they graduated.

Using event history analysis could be problematic as many students take a break from school for a semester (Mallette & Cabrera, 1991). This is especially important to

consider in light of the research stating that first-generation students are likely to be older and have families (Inman & Mayes, 1999; Mehta, et al., 2011) and could be more likely to stop out and then return to college (Chen & Carroll, 2005). If these students did stop out, they would not be considered graduates in an event history analysis. It could be interesting to conduct a study where both an event history analysis and logistic regression were used to see if the outcomes regarding student graduation differed for the data used by Martinez, et al. (2009). While event history analysis is an approach that is different from those of the other studies included in this review, the study findings were similar in that first-generation students were more likely to drop out of college as were individuals with low GPAs and those working a greater number of hours.

First-generation Student Debt

When examining the educational outcome of debt, specifically debt in the form of loans taken out to pursue a degree, it was important to explore both the concepts of debt aversion and debt accumulation. Because of the limited research examining loan debt for first-generation students, I examined literature related to both first-generation and low-income students. This is an appropriate approach because, as was noted earlier, many first-generation students also identify as low-income (Bui, 2002; Nunez & Cuccaro-Alamin, 1998; Saenz, 2007; Terenzini, et al., 1996).

Debt aversion. When examining debt tendencies for first-generation students, Burdman (2005) found that low-income, minority, and first-generation college students are typically averse to debt and tend to work full-time instead of taking loans more than their continuing-generation peers. He found that 13% of students, whose parents did not finish high school, worked full time and took no loans during college, compared to 6% of

students whose parents had a graduate degree who worked full time and took no loans during college. In order to assist first-generation and low-income students, Burdman suggested increasing awareness of financial options and making more grant money available to students whose reluctance to borrow may impact their enrollment in college. He also argued that simpler income-based repayment plans for loans would assist first-generation and low-income students.

Campaigne and Hossler (1998), Engle and Tinto (2008), Lohfink and Paulsen (2005), Lundberg, et al. (2007), and Somers, et al. (2004) reported findings similar to Burdman (2005). All of these studies found that low-income students were generally averse to taking out loans and accumulating debt. If grants are unavailable or do not cover the full cost of college, loan aversion could be a barrier to access for low-income individuals (Burdman, 2005; Campaigne & Hossler, 1998; Engle & Tinto, 2008). In fact, Lundberg, et al. found that, as a consequence of loan avoidance, first-generation college students are often unable to access financial assistance to cover the cost of college. Lohfink and Paulsen also reported that first-generation students are more likely to drop out of college than take out loans.

While first-generation students are generally debt averse, Ekstrom, Goert, Pollack, and Rock (1991) found that students from "low socioeconomic status (SES) families were most likely to have educational debts by their senior year in college; approximately 60 percent of such students were indebted" (p 8). These findings may be different from those of Campaigne and Hossler (1998), Engle and Tinto (2008), Lohfink and Paulsen (2005), Lundberg, et al. (2007), and Somers, et al. (2004) in part because the study participants were low-income students rather than those individuals specifically

identified as first-generation; however, these findings directly contradict those of Campaigne and Hossler (1998) who found that low-income students were unlikely to take on loan debt. Ekstrom, et al. only included full-time students who had no break in their enrollment. As such, it is not surprising that there are differences between the two studies. Because of the different findings and the fact that debt accumulation is not considered a variable in much of the literature regarding first-generation student graduation levels, this outcome was a focus of this study.

Debt accumulation. Through the completion of a bachelor's degree, first-generation students obtain something that many of their peers and their parents did not. A bachelor's degree is one way to increase social mobility (Haveman & Smeeding, 2006). However, if students graduate with an amount of debt that is greater than their continuing-generation peers or if that debt amount is larger than is considered manageable, then their gains in social mobility may be limited. As such, for this literature review, it was important to consider the level of debt with which first-generation students leave postsecondary education.

Manageable debt. There is little, if any, unbiased empirical research available to answer the question of what amount of student loan debt is manageable, which is why the studies cited above and this study used information found in two separate reports, Scherschel (1998) and Baum and Schwartz (2005), while acknowledging that the reports are agency-funded as opposed to peer reviewed studies. Scherschel reported that most student loan lenders believe that students should maintain a level of student debt at or below 8% or below of their pretax income. Scherschel stated that this "appears to be derived from standard credit underwriting standards that limit monthly mortgage

payments" (p. 9). Baum and Schwartz also discussed the 8% debt rule, which is calculated from lender-established ratios of acceptable nonmortgage debt. This can be misleading because lenders argue that 8% of all other debt is acceptable while this number is specific to student loan debt. The proposed study will use the 8% figure used by other researchers examining student loan debt burden (Baum & Schwartz, 2005; Gross, Cekic, Hossler, & Hillman, 2009; Scherschel, 1998).

Nunez and Cuccaro-Alamin (1998) reported that 22% of first-generation students took on loan debt compared to 18% of their continuing-generation peers. Choy and Carroll (2000) found that the majority of first-generation students, 62%, had no loan debt 4 years after graduation. This may be because they never took out loans or because they had paid off the loans in that timeframe. Although the majority of students were debt-free 4 years after graduation, individuals making less than $20,000 annually after college had a debt burden equivalent to 10% of their monthly income, which is higher than the 8% considered manageable (Baum & Schwartz, 2005; Gross, et al., 2009; Schershel, 1998).

First-generation loan accumulation and debt. Graduating with a level of debt considered to be manageable can be challenging for first-generation students, especially if their financial aid packages include more loan than grant aid. Engle and Tinto (2008) reported that individuals who are first-generation and low-income received approximately 53% of their financial aid package through loans while individuals who reported only one of these characteristics (i.e., low-income or first-generation) received 74% of their aid through loans. Individuals who identify as neither first-generation nor low-income receive a larger portion of their aid, 87%, in the form of loans. This research reveals that students with the greatest level of need, first-generation and low-income

students, do receive a higher percentage of nonloan aid. While this is promising, this group is also least likely to persist to graduation (Engle & Tinto, 2008). Individuals identifying as first-generation *or* low-income as opposed to the two characteristics together are more likely to graduate; however, these students take on significantly more loan debt than students who identify as first-generation and low-income. Average loan debt may be lower for first-generation and low-income students because these students do not persist to graduation at the same rate. These statistics are concerning unless low-income students experience a substantial gain in social mobility that provides the economic fortitude to pay off their loans.

Engle and Tinto (2008) also found that debt accumulation for a bachelor's degree is not equitable; low-income and first-generation students have an average of $4000 more in debt than their peers who identify as either first-generation or low-income. Engle and Tinto reported that low-income, first-generation students were dropping out in their 4th year, with no degree and an average of $16,548 in debt (Engle & Tinto, 2008). While individuals who complete some college have higher income levels than those with only a high school diploma (Bureau of Labor Statistics, 2013), they generally do not have the same earning potential as individuals with a bachelor's degree. This makes loan default even more likely for students who drop out of college later in their college career with a high amount of debt than those who leave college early on.

Gross, et al. (2009) and Volkwein and Szelest (1995) reported that first-generation students were more likely to default on loans than their continuing-generation peers. In addition, Volkwein, Szelest, Cabrera, and Napierski-Prancl (1998) reported that some groups of minority and first-generation students were more likely to default than

others. While default was not an outcome explored in this study, this research demonstrates that although first-generation students may increase their social mobility through degree attainment, they do not necessarily do so with a manageable amount of debt. In addition to being a variable that should be explored further, their higher likelihood of loan default raises questions about the effectiveness of financial aid policies and advising for first-generation students (Haveman & Smeeding, 2006). These students may be unaware of the need to compare an expected salary to the amount of debt they accumulated, or they may not know that they have to repay loans after graduating from college or may be confused by the process (Volkwein, et al., 1998).

Employment

Regardless of the amount of debt accumulated while in postsecondary education, student employment status at the time of graduation is an important variable to consider. This illuminates whether students can begin making payments on their loans and increase their social standing based on employment. There is limited research exploring the employment of first-generation students after degree completion. In fact, I found only three studies examining this (Nunez & Cuccaro-Alamin, 1998; Saenz, 2007; Thomas & Zhang, 2005). Nunez and Cuccaro-Alamin found that first-generation students were employed at rates and salaries similar to those of their continuing-generation peers. First-generation students who did not complete a degree at the end of the study or who had dropped out of postsecondary education were less likely to be employed in management positions and more likely to work in a field requiring a skilled trade compared with their continuing-generation peers who did not complete a degree (Nunez & Cuccaro-Alamin, 1998). Comparable salaries and employment rates can illustrate whether first-generation

students who complete bachelor's degrees can make gains in social mobility regardless of their field of employment. However, student loan debt was not considered a factor in relation to whether the salary is enough to repay student loans (Nunez & Cuccaro-Alamin, 1998). Without taking student loan debt into consideration, gains in social mobility cannot be truly gauged. While these findings are promising in that first- and continuing-generation students earn comparable salaries after graduation, there appears to be limited, if any, research replicating these findings.

The findings of Thomas and Zhang (2005) contradict those of Nunez and Cuccaro-Alamin (1998). Thomas and Zhang reported that first-generation students earned less than their continuing-generation peers while Nunez and Cuccaro-Alamin reported that salaries were similar. The research conducted by Thomas and Zhang did not, however, place first-generation students as a primary focus of the study; rather, they considered the impacts of college quality and academic rigor. The numbers of first-generation students included in their sample may not be representative because of this.

While these findings are interesting, they do not include variables that isolate the relationship between first-generation status and employment. Because this study did not replicate the variables, the results are not truly comparable to those of Thomas and Zhang (2005). Thomas and Zhang used a different NCES dataset than that used by Nunez and Cuccaro-Alamin (1998), the Baccalaureate and Beyond (B&B: 93/97) as opposed to the Beginning Postsecondary Survey (BPS: 90/94). While Nunez and Cuccaro-Alamin did use first year data from the B&B: 93/94, they did not use the follow-up data. The use of separate instruments paired with the fact that the B&B had an additional follow up to the instrument used by Nunez and Cuccaro-Alamin could explain the differences in these

studies. Both of these studies also used data that were 15 years old, so reexamining the findings with an updated dataset helped to determine whether differences in salaries have changed over the past decade.

Conceptual Framework

This study was examined through the lens of social mobility theory. Social mobility theory examines concepts often associated with the American Dream in which individuals are able to increase their socioeconomic status and class by working hard and continually moving up in their occupation thus increasing their income (Haveman & Smeeding, 2006). Social mobility can occur when an individual experiences an increase or decrease in their social class; however, the aim of this study is to explore positive gains.

It is first important to note the historical perspectives on social mobility theory. Publications exploring social mobility have been in existence for over 60 years, and the study of social mobility has evolved over time. Social mobility theory first emerged in the 1950s with Prais (1955) who began exploring how individuals move from one social class to another. Prais attempted to calculate the average time that it takes to move from one social class to another given a series of mathematical calculations. He noted that increasing job opportunities and birth rates could impact mobility. van Leeuwen and Maas (2010) noted in their historical study of social mobility that many of the early views of social mobility, including Prais', did not include factors of income and education because these were not available. As such, earlier studies were limited in their generalizability and occupations were the most commonly compared variables leading to social mobility. Social mobility theory examination has advanced in the past few decades

and now researchers are able to compare important factors of occupation and class over time (van Leeuwen & Maas, 2010).

Social mobility as used in this study is framed by the work of Haveman and Smeeding (2006) and Isaacs and Sawhill (2008). Isaacs and Sawhill (2008) acknowledged that there is a widening gap between social classes in the United States. While they mentioned the disparity in income between the middle and upper classes specifically, this widening gap is also evident for lower income families. The literature cited above confirms this widening gap as individuals from higher income and continuing-generation families have higher graduation rates and lower levels of debt than first-generation and low-income families (Cabrera, et al., 2012; Chen & Carroll, 2005; Engle & Tinto, 2008; Ishintani, 2006; McCarron & Inkelas, 2006; Warburton, et al., 2001).

Figure 1 illustrates how first-generation students can experience positive gains in social mobility through the acquisition of cultural, social, and human capital.

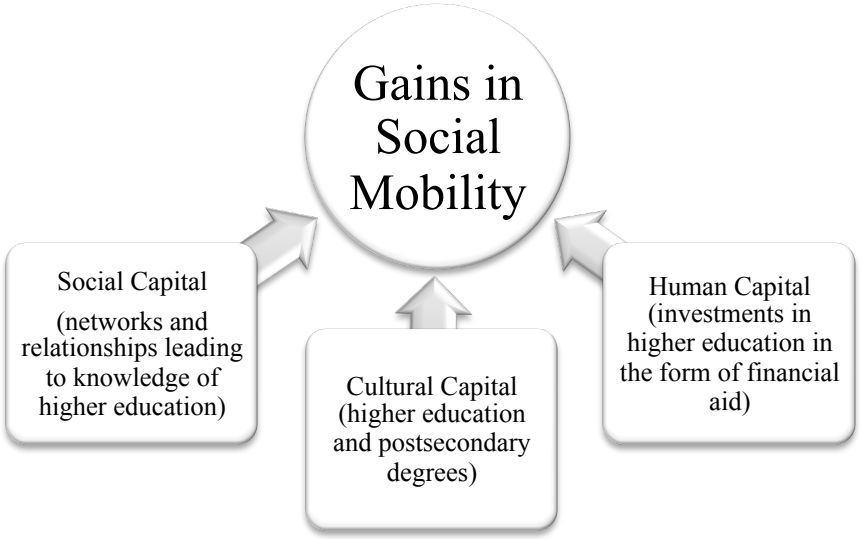

Figure 1. Social mobility theory conceptualization. This figure explains the types of capital that lead to gains in social mobility.

Individuals have differing levels of cultural capital based largely on familial indicators such as family wealth, educational attainment levels, and geographic location. Cultural capital for purposes of this study refers to individuals' knowledge and skills related to higher education and the processes associated with higher education such as admissions and financial aid (Sullivan, 2001). Social capital is another concept that impacts first-generation students' ability to succeed in postsecondary education and to experience gains in social mobility (Helliwell & Putnam, 1999). For purposes of this study, social capital includes the networks and relationships of which an individual is a part that allow them to gain knowledge of higher education (Helliwell & Putnam, 1999). Human capital encompasses an individual's productivity and their ability to earn income and contribute to society. Sweetland (1996) described education as a form of human capital in that many benefits are derived from participation in education including health, nutrition, and an overall increase in the quality of life. Often, grants, loans, and scholarships are seen as an investment in human capital because providing monetary support while students are enrolled provides an opportunity for them to be healthier and have higher earnings (Paulsen, 2001). For purposes of this paper, loans were viewed as a form of investment in human capital. Even though they offer only a temporary release from students' financial obligations, loans can provide students with liquidity relief for a period of time while they pursue a degree. First-generation individuals' knowledge and awareness of access to higher education can be positively impacted because of increased access to cultural, social, and human capital, and gains in each of these areas can ultimately lead to positive gains in social mobility.

By framing this study with social mobility theory, I was able to offer a

contribution to the literature that can inform policy and best practices associated with first-generation college students. Although first-generation students access higher education at a lower rate than their continuing-generation peers, this study examined whether a postsecondary degree narrowed the gap between first- and continuing-generation students in terms of employment. This exploration is framed through social mobility theory.

Haveman and Smeeding (2006) noted that social mobility theory is very similar to the concept of the American Dream, an ideal in which improvements in social mobility are possible for anyone who works hard. Social mobility theory states that if individuals work hard enough, they can achieve anything, including completing their degree and ensuring higher income prospects than they had growing up. In 1999, 66% of individuals in the United States reported that they believed in the reality of the American Dream (Isaacs & Sawhill, 2008). However, only 58% of individuals increased their income quartile over their lifetime, and only 6% of individuals born into the lowest social class increased their earnings to the extent that they were able to secure a place in the highest income quartile (Isaacs & Sawhill, 2008). Movement between income quartiles is essentially how social mobility is defined. Through securing higher earnings, individuals can increase their social class, which leads to upward social mobility (Isaacs & Sawhill). However, as noted above, great jumps in social mobility are rare. Isaacs, Sawhill, and Haskins (2008) noted that for children born into the lowest income quartile, attaining a bachelor's degree makes them 84% more likely to move up at least one quartile. This does, however, bring to mind questions of the feasibility of the American Dream, and whether increasing social mobility is truly possible for all individuals living in the US or

just the select few.

Critical Race Theory (CRT) contradicts the idea that social mobility is indeed the same for all individuals. One of the basic tenants of critical race theory is that racism is still present and must be acknowledged as something that still exists today rather than disregarding the problem with stances such as colorblindness (Delgado & Stefancic, 2012). In fact, in CRT, colorblindness and concepts like the American Dream are seen as false constructs that are designed by the dominant powers in society (Tate, 1997). CRT researchers also note that much of the research in the field of education and well beyond is centered around middle class, White individuals and that all other cultures are compared to that, which is even evident in the literature review of this dissertation (Yosso, 2006). This sets up research as framed from a deficit model where all findings that fall below that of White, middle class individuals are negative. Thus, society must fill that gap in the lack of knowledge, skills, and/or capital needed for individuals to succeed when, in fact, their story is different than that of White, middle class individuals (Yosso, 2006). Crenshaw (1989) notes that concepts such as colorblindness are incorrect because individuals have been treated differently historically and these views are still perpetuated today. This view can be carried over into concepts like that of the American Dream, where gains in social mobility have historically been inequitable and they continue to be inequitable as discrimination still exists in society, in particular, when one of the largest contributors to an individual's social status and mobility is the status that they inherit. (McNamee & Miller, 2014). This inequity is still present in higher education today, although there continue to be efforts aimed at addressing the inequities.

Haveman and Smeeding (2006) noted that social equality has not always been

embraced in higher education. When some populations do not have access to higher education, instead of serving as a great equalizer, higher education largely helps the wealthy and advantaged maintain or improve their status. At the same time, those with lower socioeconomic status and lower levels of parental education face fewer opportunities for access to higher education and less knowledge about admissions processes and financial aid because of gaps in both social and cultural capital. Haveman and Smeeding (2006) noted that top tier schools typically enroll wealthy students, and that the number of underrepresented students who qualify to enter these institutions is not represented in the number enrolled (Blumenstyk, 2013; Reardon, Baker, & Klasik, 2012). This perpetuates social inequities.

Despite the inherent inequity present in higher education, upward mobility is possible for some subpopulations and does occur within the United States through the medium of degree attainment (Haveman & Smeeding, 2006). However, colleges, foundations, states, and even the President of the United States (American Association of State Colleges and Universities [AASCU], 2011; The White House, 2012) recognized inequities in access to and graduation from higher education and have created initiatives to increase access and completion for a larger portion of the United States population. These initiatives include College Board's College Completion Agenda and the Complete College America initiative, funded by several organizations, including the Carnegie Corporation, Lumina, and the Bill and Melinda Gates Foundation. Degree attainment in itself, however, cannot solely provide gains in social mobility as actual social mobility occurs with gainful employment in a position that increases an individual's lifetime earnings. This study explored the outcomes of graduation from an institution of higher

education, debt accumulation at the time of graduation, and employment at time of graduation.

While these outcomes do not measure mobility over time, I was able to explore the concepts surrounding social mobility, including whether first-generation students are comparable to their continuing-generation peers in terms of these educational outcomes and whether race plays a factor in social mobility. Specifically, this study explored social mobility in terms of first-generation students who have graduated from college securing employment at a rate equal to their first-generation peers with similar amounts of debt. While this is not how social mobility theory has been utilized in the past, this new conceptualization allows for an examination of whether a degree positively impacts social and cultural capital in a way that allows for first-generation students to experience postgraduate success in ways similar to their continuing-generation peers.

Literature Review Summary

A thorough review of the literature reveals that first-generation students are a diverse group of individuals with characteristics that set them apart from their continuing-generation peers. First-generation students are more likely to be students of color and low-income when compared to their continuing-generation peers (Bui, 2002; Horn & Nunez, 2000; Nunez & Cuccaro-Alamin, 1998; Saenz, 2007; Terenzini, et al., 1996). They tend to be older, work more hours, and have lower levels of academic performance in terms of high school and college GPA (Amelink, 2005; Chen & Carroll, 2005; Engle & Tinto, 2008; Inman & Mayes, 1999; Kuh, et al., 2006; Mehta, et al., 2011; Saenz, 2007). First-generation students enroll in college, accumulate fewer hours each semester, and graduate at rates lower than their continuing-generation peers (Cabrera, et al., 2012;

Chen & Carroll, 2005; Choy, 2001; Engle & Tinto, 2008; Fike & Fike, 2008; Ishintani, 2006; McCarron & Inkelas, 2006; Saenz, 2007; Warburton et al., 2001). Findings are mixed related to the amount of debt first-generation students carry and their salaries at the time of graduation compared to their continuing-generation peers (Engle & Tinto, 2008; Nunez & Cuccaro-Alamin, 1998; Saenz, 2007; Thomas & Zhang, 2005).

While each of the topics explored in the literature review, including graduation, debt, and employment, have been considered by other authors, the large majority of studies have not been updated in the last 10 years. With universities considering new interventions for students, changes in federal financial aid policies, and historic events like the great recession in the early 2000s, an updated consideration of these factors is necessary.

One of the challenges of examining first-generation educational outcomes such as graduation, debt accumulation, and employment is that the studies included in the literature review include a wide variety of variables. While this is helpful for exploring the correlation between different variables and stated outcomes, it confounds the problem of isolating which variables have the greatest impact on specific outcomes. This study included selected variables that were consistent across the studies reviewed in order to explore whether the correlations between these variables and the stated outcomes remained consistent regardless of the number of variables included. The variables considered were: first-generation status, gender, income, age, high school GPA, household income, race, hours worked while enrolled, number of dependents, cost of tuition, and pattern of enrollment.

Conducting the study through the lens of social mobility theory (Haveman &

Smeeding, 2006; Isaacs & Sawhill, 2008) provided a lens for viewing and interpreting the data. This helped answer the question of whether first-generation students were truly able to increase their social mobility through the acquisition of a bachelor's degree, or if the American Dream leaves something to be desired in terms of positive outcomes for all.

Additionally, this study helped fill a gap in the literature by examining the debt to income ratio for first-generation college students. While some authors considered the higher loan default rate for first-generation college students (Volkwein & Szelest, 1995; Volkwein, et al., 1998), they did not discuss whether first-generation students had a manageable amount of debt at the time of graduation. Conversations such as this can guide policy surrounding financial aid advising at colleges and universities on topics such as incurring a manageable amount of debt when compared to lifetime earning potential.

CHAPTER III

RESEARCH DESIGN

To explore a gap in the literature regarding the educational outcomes of first-generation and continuing-generation students, this study employed nonexperimental, quantitative methods examining the outcomes of graduation, debt accumulation, and employment of first-generation students compared to their continuing-generation peers.

Research Questions

This study was exploratory in nature and aimed to examine how first-generation status is related to the achievement of postgraduate outcomes while considering how social mobility is impacted by outcome achievement. This study was not designed to test a hypothesis but it was informed by social mobility theory. Research exploring these relationships can inform support services and financial aid advising practice and research.

Through an exploratory analysis, this study sought to examine the following research questions:

1. How do first-generation students differ from their continuing-generation peers in terms of their educational outcomes? What factors lead to positive gains in these outcomes?
2. How does the ratio of debt to income vary for first-generation students and their continuing-generation peers? Is this level of debt manageable?

3. How do these outcomes differ for first-generation students who are also low-income and/or ethnic minority? How do these outcomes differ for the different definitions of first-generation?

Data and Instrumentation

Archival data for this study were gathered from the National Center for Education Statistics (NCES) Beginning Postsecondary Students (BPS) Longitudinal Study (BPS: 04/09), which is an instrument designed to gather persistence and educational outcome-related information for students in the United States postsecondary education system. This BPS survey represents the first time that students were considered at multiple institutions and where both traditional and nontraditional students were included in the study (Wine, Janson, & Wheeless, 2011).

Sample

The initial sample of first time students included in the survey was gathered from the National Postsecondary Student Aid Study (NPSAS, 2013), which is a large dataset with information included from federal, state, and local entities, including employer and institution reported enrollment and financial aid data. Students included in the study were in their first year of postsecondary education. Students were selected through fixed-type sampling rates of student type, including type of undergraduate, type of professional student, and type of graduate students. Students were selected from institutions that were eligible to receive federal financial aid. Some states had been oversampled to gather an adequate sample from all institution types (Wine, et al., 2011).

Data from this study were then combined with additional information to create the

BPS Longitudinal Study. Students in the initial cohorts were followed for 6 years with follow-up information gathered at 3 and 6 years. These students were administered three interviews, largely completed in a web-based format, in which students responded to questions related to background, persistence, employment, debt, goals, achievement, and other factors, and the response rate was approximately 90% (Wine, et al., 2011).

In addition to collecting interview information, the researchers in the BPS study collected information from postsecondary transcripts and utilized information from phone calls and physical mailings as well. This study also included student-level data collected by the NCES (n.d.). The dataset for this study was released in 2011 for restricted use licenses.

The 2004 study included a sample of 16,680 and that group of students was followed for 6 years (Wine, et al., 2011). This study was delimited from the original 16,680 students to include only students from the original sample who attended public, 4-year institutions. The reason for this selection was to allow for an exploration of postgraduate outcomes for first-generation students without having to account for inherent differences in graduation rates and debt accumulation associated with other institutional types. Students were the unit of analysis for this study. The final sample of students included in this study was 4582.

Validity and Reliability

Because BPS:04/09 data were collected through the National Center for Education Statistics, validity and reliability were determined when the NCES developed the survey and interview instruments. Many different data collection methods were used; validity and reliability were considered in different ways for each collection method. In

cases where reliability was not achieved, those variables were excluded from the dataset. For the first time, transcripts and course catalogs were considered in this BPS administration as well. Because of the multistage design of the BPS survey, the large sample size, and the differing response rates between types of student and institution, the design effects and sample errors present in this study were quite large (Wine, et al., 2011). Wine, et al. noted that this is known and is consistent with prior BPS datasets.

Outliers and Missing Cases

Outliers were identified in the National Center for Education Statistics cleaning of the data and were coded as -6 noting that the values were outside of the range of the studies. Missing values were handled in a similar way where values were coded as -9 if the values were missing. Branching questions were appropriately coded as skipped if questions did not apply to a certain subset of the population. Adjusted weights were precalculated for many of the variables for nonresponse bias and were included in the overall BPS:04/09 dataset. A complete set of these calculated weights can be found in the BPS: 04/09 Full-Scale Methodology Report (Wine, et al., 2011).

Outcome and Predictor Variables

The three outcomes or dependent variables examined in this study were graduation, debt, and employment. This study measured the relationship between these outcomes and selected independent variables as all variables had already been operationalized in the design of the BPS:04/09. The outcome variables of graduation and employment were dichotomously coded. Cumulative loan debt was a continuous variable. The distribution of cumulative loan was severely non-normal, thus, the log of this

outcome was calculated and used in place of the raw income values. This occurred because 49% of students had no loan debt; however, to gauge the full picture of student loan debt and to see if this research aligns with prior research stating that first-generation students are loan averse, I chose to run the model including zeros recognizing that this violates the assumption of normal distribution.

Independent variables were used for each definition of first-generation student (those for whom neither parent attended college, those whose parents only attended some college, and those whose parents attained less than a bachelor's degree) and for continuing-generation students to allow for comparisons. Table 1 summarizes the dependent variables included in this study, including how they were measured.

Table 1 Dependent Variables

Variable	**Variable Name**	**Definition**	**How Measured**
Degree	ATTYPE6Y	Type of degrees attained through 2009	Categorical, but will be dichotomously coded as bachelor's degree attained or not
Debt	CUMULN09	Cumulative loan amount through 2009	Continuous
Employment	JOBST09	Employment status in 2009	Dichotomous (employed or not employed with no response for individuals still enrolled)
Debt Percent	EDPCT09	Percent of monthly income going toward loan payment	Continuous

Additional independent variables that were included to examine social mobility and to align with prior research were: household income at time of enrollment, gender, ethnicity, hours employed during college, age when enrolling in college, marital status, dependents, high school GPA, cost of tuition, hours enrolled during first semester, and final cumulative GPA. Considering household income, gender, ethnicity, and high school GPA allowed for the exploration of precollege characteristics and established a baseline from which to gauge social mobility. Age, marital status, hours employed, and whether or not an individual has dependents while enrolled in college allowed for the examination of whether there was a relationship between external responsibilities and postgraduate outcomes.

This study considered the interactions between first-generation status, ethnicity, and socioeconomic status because these interactions were noted as significant in prior research (Bui, 2002; Nunez & Cuccaro-Alamin, 1998; Saenz, 2007; Terenzini, et al., 1996). Examining these interactions illuminated whether the study sample was similar to those used in studies citied in the literature review that stated that first-generation students tend to be older, work more, and have higher levels of noncurriculum responsibilities. Table 2 details the independent variables considered in this study.

While prior research noted that first-generation students were more likely to be married and have dependents (Cabrera, et al., 2012; Chen & Carroll, 2005; Inman & Mayes, 1999; Nunez & Cuccaro-Alamin, 1998), these variables were excluded from the analysis, because fewer than 100 individuals were married and only 153 individuals had dependents. The variable of delayed enrollment (Cabrera, et al., 2012) was also excluded, because the mean of those individuals who did delay enrollment was .61.

Table 2 Independent Variables

Variable	Variable Name	Definition	How Measured	Studies Using a Similar Variable
First-generation None	PAREDUC2	Derived variable of parents receiving a high school diploma or less	Dichotomous; Dummy coded with first gen as reference	N/A
First-generation Some	PAREDUC4	Derived variable of parents attending less than two years of college with no degree	Dichotomous; Dummy coded with first gen as reference	N/A
First-generation Degree	PAREDUC6	Derived variable of parents attending 2 or more years of college and/or receiving associate's degree but no bachelor's degree	Dichotomous; Dummy coded with first gen as reference	N/A
Household Income	CINCOME	Income percentiles for all students. Uses parents' income if student is dependent and student's own income if student is independent	Continuous	Cabrera, Burkum, LaNasa, & Bibo, 2012; Chen & Carroll, 2005; Engle & Tinto, 2008; Ishintani, 2006; McCarron & Inkelas, 2006; Warburton, et al., 2001
Gender	GENDER	Student gender	Dichotomous; Dummy coded with female as reference	
Marital Status	SMARITAL	Student marital status during 2003-04	Categorical: Single, divorced, or widowed; married; separated	N/A
Dependents	DEPANY	Living with children or dependents	Dichotomous; Dummy coded with having dependents as reference	Cabrera, et al., 2012; Chen & Carroll, 2005; Inman & Mayes, 1999; Nunez & Cuccaro-Alamin, 1998
Tuition	TUITION2	Tuition and fees in 2003-04	Continuous	Inman & Mayes, 1999; Pascarella, et al., 2004; Saenz, 2007
First Pattern of Enrollment	ENINPT1	Pattern of enrollment for 2003-04 (mainly full time, part time or mixed semesters)	Categorical; No degree; full time; Part time and mixed combined to account for greater percent of the sample	Fike & Fike, 2008
Pattern of Enrollment	AT1DIP6Y	Pattern of enrollment (mainly full time, part time or mixed semesters) through 2009	Categorical; No degree; full time; Part time and mixed combined to account for greater percent of the sample	Chen & Carroll, 2005
Race	RACE	Student ethnicity status	Categorical; Recoded to represent underrepresented and Asian	Bui, 2002; Horn & Nunez, 2000; Nunez & Cuccaro-Alamin, 1998; Saenz, 2007; Terenzini, et al., 1996
Hours Worked	JOBHOUR2	Hours worked per week while enrolled	Continuous	Inman & Mayes, 1999; Mehta, et al, 2011; Saenz, 2007
Delayed Enrollment	DELAYENR	Number of years enrollment was delayed between HS graduation and enrollment in postsecondary education	Continuous	Cabrera, et al., 2012

This demonstrated that for those individuals who did delay enrollment, the average time of delay was slightly more than one semester. Whether a student took classes mostly part time, mostly full time, or a mixed pattern of enrollment toward degree attainment (Chen & Carroll, 2005) was removed because there was not enough representation in the categories of the variable; two of the variables accounted for less than 10% of the overall sample (Cohen, 2013).

In the final sample, 44% of students were first-generation as defined in the broadest sense as neither parent receiving a bachelor's degree. When examining the sample in terms of the three first-generation definitions examined earlier, the largest category was neither parent having enrolled in college, which represented 20% of the overall sample. Neither parent having completed any degree and neither parent having completed a bachelor's degree each represented 12% of the overall sample. The remaining 56% of students were identified as continuing-generation.

For purposes of this study, race and ethnicity were categorized into Underrepresented, Asian, and Caucasian. The American Psychological Association (2012) noted that underrepresented students identifying as Native American, African American, Latina/o, and Southeast Asian tend to have lower performance than White students and other Asian American students. This is consistent with other national reports where Asian American students tend to score at or above the rates of White students on nationally standardized tests (Camara & Schmidt, 1999; National Assessment of Educational Progress [NAEP], 2014). Because of the variability in the Asian student population, Asian students were categorized separately from the underrepresented student grouping in this study.

The underrepresented student group in this study consists of students who identified as African American, Hispanic, or Native American. The category of underrepresented students is consistent with the definition used by the National Academy of Sciences (2011) and in many college admissions processes. Overall, these students represented 22% of the total sample. Asian American students comprised 6% of the sample and Caucasian students represented the remaining 72% of students. This study did not include a field for students identifying as more than one race.

Study Design

I conducted a nonexperimental, quantitative study examining the outcomes of graduation, debt accumulation, and employment of first-generation students compared to their continuing-generation peers. As this study aimed to examine the social mobility of first-generation students, each of the outcome variables was selected with this conceptual framework in mind. The goal of exploring this study through the lens of social mobility was to see, of those students who graduated, were they able to secure employment opportunities at the same rate as their peers with similar amounts of debt. By examining these outcomes, the researcher was able to determine if social mobility had been attained.

Although there are no studies cited in this literature review that used data from the most recent BPS survey administration, Choy (2001), Engle and Tinto (2008), Nunez and Cuccaro-Alamin (1998), and Warburton, et al. (2001) each used prior administrations of the BPS in their analyses. Each of these studies was conducted by the NCES or published through the Pell Institute, so their methods are not clearly identified as a component of their publications. The studies share descriptive statistics, and Nunez and Cuccaro-Alamin conducted a multivariate analysis in the form of an ordinary least squares (OLS)

regression. Many of the studies cited in the graduation and employment portions of the literature review also use regression models.

All inferential and descriptive statistics in this study were conducted using Stata, version 13 (Stata, 2013). This study does not demonstrate causation for why students achieve or do not achieve educational outcomes; rather, it explores the correlations between variables. Logistic regression was most appropriate for analyzing graduation and employment because they were coded as dichotomous variables (Cabrera, 1994) while an OLS regression was conducted for debt to examine the linear relationship of a continuous dependent variable with multiple independent variables (Allison, 1998).

To answer questions related to graduation and employment, two dichotomously coded (i.e., students graduate or do not and are employed or unemployed) variables were used. To examine each definition of first-generation in these regressions, this study employed six logistic regressions with a separate logistic regression for each first-generation definition. The use of logistic regression allowed for odds ratios to be calculated to explore how likely first-generation and continuing-generation students are to reach educational outcomes based on their background characteristics and experiences in college. The outcome of debt was a continuous variable and utilized the Ordinary Least Squares (OLS) regression model, a linear model that was used to estimate the dependent variable of debt rather than calculating the probability of debt occurring. Three OLS regressions were run with each regression considering a separate first-generation definition. These regressions addressed the study's first research question.

A secondary analysis of the logistic regression models utilizing the Fairlie (2005) decomposition method examined the separate contributions of the independent variables,

especially first-generation status, household income, and race and whether their contributions differed depending on the outcome of graduation, employment, and debt. The Blinder-Oaxaca decomposition method also examined the separate contributions of the independent variables, except that it was used for a linear regression model. To further isolate the differences for each of the definitions of first-generation, the logistic regression with the dependent variable of graduation was further examined with the Fairlie decomposition method with three different samples corresponding with the three definitions of first-generation. This allowed for a visualization of the individual differences in first-generation definitions.

The second research question was addressed through the use of three OLS regressions using debt to income ratio as the continuous outcome variable. Three regressions were conducted to explore each of the three first-generation definitions. The mean salary after graduation, average debt to income ratio, and the average cumulative loan debt including and excluding those with zero debt was reported for first- and continuing-generation students as well as the overall average in order to further explore this research question.

To answer the final research question, two additional logistic and one additional OLS regressions were conducted with the same outcome variables of graduation, debt, and employment. These regressions allowed for the exploration of the interactions between the definition of first-generation student with the low-income and ethnicity variables. The interaction analyses were conducted separately in order to not confuse the initial interpretation. This allowed for the exploration of differential outcome achievement. Table 3 details each of the analyses conducted in this study.

Table 3 Analyses Conducted

Question Number	Outcome Variable	First-generation Definition and Interactions	Analysis Used
Research Question One	Graduation	First-generation Definition One	Logistic Regression
		First-generation Definition Two	Logistic Regression
		First-generation Definition Three	Logistic Regression
	Cumulative Loan Debt	First-generation Definition One	OLS Regression
		First-generation Definition Two	OLS Regression
		First-generation Definition Three	OLS Regression
	Employment	First-generation Definition One	Logistic Regression
		First-generation Definition Two	Logistic Regression
		First-generation Definition Three	Logistic Regression
Research Question Two	Monthly Debt Percent	First-generation Definition One	OLS Regression
		First-generation Definition Two	OLS Regression
		First-generation Definition Three	OLS Regression
Research Question Three	Graduation	First-generation Definition One* Household Income*Underrepresented Status	Logistic Regression
	Cumulative Loan Debt	First-generation Definition One* Household Income*Underrepresented Status	OLS Regression
		First-generation Definition Two* Household Income*Underrepresented Status	OLS Regression
		First-generation Definition Three* Household Income*Underrepresented Status	OLS Regression
		First-generation Definition Two* Household Income*Underrepresented Status	Logistic Regression
		First-generation Definition Three* Household Income*Underrepresented Status	Logistic Regression

CHAPTER IV

RESULTS OF THE STUDY

This chapter will share the demographic characteristics of the overall sample as well as a break down for each of the three first-generation definitions. Also included in this chapter are the findings relative to each of the three research questions examining the educational outcomes for first-generation students compared to their continuing-generation peers. The three research questions were the following:

1. How do first-generation students differ from their continuing-generation peers in terms of their educational outcomes? What factors lead to positive gains in these outcomes?
2. How does the ratio of debt to income vary for first-generation students and their continuing-generation peers? Is this level of debt manageable?
3. How do these outcomes differ for first-generation students who are also low-income and/or ethnic minority? How do these outcomes differ for the different definitions of first-generation?

Sample Characteristics

As mentioned in Chapter III, archival data from the Beginning Postsecondary Students (BPS) Longitudinal Study were used in this study. The original sample included approximately 16,680 students. After the sample was delimited to include only students

between the ages of 18 and 69 attending public, 4-year institutions, 4594 students remained in the sample for analysis.

Table 4 details demographic characteristics for each of the three first-generation definitions and characteristics of the overall sample. Continuing-generation was not included as a category in the table because the definition of continuing-generation would vary depending on each definition of first-generation.

Table 4 Demographic Characteristics of the Sample

	First-Generation Definition One Percentage	**First-Generation Definition Two Percentage**	**First-Generation Definition Three Percentage**	**Overall Percentage**
Number of Students	908	1443	1988	4594
Average Hours Worked 2003-04	15	15	15	12
Average Age	20	20	19	19
Underrepresented	32%	29%	29%	22%
Female	59%	60%	60%	56%
Dependents	8%	7%	6%	3%
Married	6%	5%	4%	2%
Average Household Income	$46,714.34	$50,244.34	$53,212.48	$72,998.57
Average First Semester Tuition	$4,088.03	$4,181.48	$4,199.19	$4,768.85

First-generation students in this sample were more likely to be identified as underrepresented when compared to the overall percentage of students identifying as underrepresented in this study. Average household income increased as level of parental education increased. These findings align with those of other researchers who reported higher proportions of first-generation students identifying as low-income and/or underrepresented (Bui, 2002; Horn & Nunez, 2000; Nunez & Cuccaro-Alamin, 1998; Saenz, 2007; Terenzini, et al., 1996). The gap in household income was largest between first-generation definition one (those students with parents who did not attend college) and the overall average household income, with a difference greater than $26,000. Individuals coming from homes with greater levels of parental education and household income also attended colleges with higher tuition; the largest gap was again between first-generation definition one and the overall average.

Marriage was not listed as a variable having an impact on the outcomes of first-generation students in the studies cited above; however Cabrera, et al. (2012) and Chen and Carroll (2005) both found that first-generation students tended to have dependents at a rate higher than their peers. In this study, individuals coming from first-generation families were also more likely to be married and/or have children than the overall average; however, these variables were excluded from the overall analysis because of the relatively small number of individuals in these categories.

Inman and Mayes (1999) reported that first-generation students tend to be older than their peers. This is true for first-generation definitions one and two in the current study; however, the difference was only 1 year when comparing averages of first-generation students to non-first-generation students. First-generation definition three

students had the same average age as the overall sample. Working more hours while in college was consistent across the three definitions of first-generation. The overall sample average hours worked in 2003-04 was 12 hours per week; however, students in all first-generation definitions worked an average of 15 hours a week. These findings are consistent with that of Inman and Mayes (1999), Mehta, et al. (2011), and Saenz (2007) who found that first-generation students reported working more than 20 hours a week on average. While the average in this study is lower than 20, the range for actual hours worked was from 0-70 hours, indicating that many first-generation students worked more than 20 and even 40 hours.

Table 5 reports on the three educational outcome variables explored in this study. In the 6-year period included in this study, 62% of students completed a bachelor's degree, and the average cumulative loan debt was approximately $12,500. In 2009, 56% of students were employed, 10% identified as unemployed, and 34% of students were still enrolled in college or were not seeking employment opportunities.

Table 5 Outcome Variable Summary

	First-generation Definition One	**First-generation Definition Two**	**First-generation Definition Three**	**Overall**
Bachelor Degree	48%	53%	57%	62%
Total Cumulative Loan Average	$14,230.44	$14,721.58	$14,664.28	$12,496.85
Total Cumulative Loan Average (excluding those with zero debt)	$19,256.70	$19,615.18	$20,022.38	$19,920.38
Average Salary 2009	$18,461.65	$18,516.36	$18,356.98	$18,885.97
Percent with Debt	73%	75%	73%	62%
Debt to Income Ratio > 0	8%	9%	9%	9%
Employed at Graduation	85%	85%	85%	85%

Consistent with prior research (Cabrera, et al., 2012; Chen & Carroll, 2005; Choy, 2001; Engle & Tinto, 2008; Fike & Fike, 2008; Ishintani, 2006; McCarron & Inkelas, 2006; Saenz, 2007; Warburton et al., 2001), first-generation students graduate at a rate lower than the overall average. This is true for all three definitions. There were no discernable differences regarding the percentage of students employed at the time of graduation because the percentages aligned around the overall average. Average loan debt for each definition of first-generation students is higher than the overall average when students taking on zero debt are factored in. However, after excluding students with zero debt, the averages align to a greater extent. This is likely because more continuing-generation students had zero debt; when they were excluded, the average increased. This is evident when looking at the percentage of students who take on debt, because more first-generation students in all categories take on debt of some sort when compared to the overall average.

This finding contradicts prior research stating that first-generation students are more loan averse than their peers. It is concerning that all three categories of first-generation students have lower graduation rates, meaning that while they have more loan debt (or close to average loan debt), fewer individuals complete a degree, which indicates that these students will likely struggle in gaining social mobility because they secure debt at a similar rate as their peers but do not achieve the same outcome of graduation.

Regression Analysis

Each of the variables identified in the methods section was included in the initial model for each of the three research questions. The initial models for each research question can be found in Appendix B. After the initial models were run, the least

statistically significant variables were removed from the model one by one until all predictors were found to be statistically significant and a final model was reached. One exception to this rule was for the key research variable of first-generation; this was left in the final model of each analysis regardless of statistical significance.

Research Question One: First-Generation and Continuing-Generation Outcomes

The first research question considered how first-generation students differ from their continuing-generation peers in terms of their educational outcomes. These educational outcomes included graduation, loan debt at graduation, and employment at the point of graduation. OLS and logistic regression models were used to examine this question. Logistic regressions were used for the dichotomous outcome variables of graduation and employment, and the OLS regression was used for the continuous outcome variable, cumulative loan debt.

Each of the regressions was conducted a total of three times for a total of nine models as each of the three outcome variables were run using each of the three definitions of first-generation. Findings are discussed below by educational outcome; within each outcome, the models for each of the three definitions of first-generation are shared.

Bachelor Degree Attainment as the Outcome Variable

The first educational outcome explored is bachelor's degree attainment. During the 6-year period included in this dataset, 62% of students completed their bachelor's degree. The completion percentage was lower for each first-generation definition with the

overall average graduation rate being the highest and first-generation definition one having the lowest graduation rate. The paragraphs below describe all definitions of first-generation and their relationships with the outcome variable of attaining a bachelor's degree.

First-generation definition one: Parents with no college. The first model considered first-generation definition one, which is students whose parents did not attend college (*n*=865). The independent variables considered in this model were the same for each of the models examining bachelor degree attainment and can be found in Table 2. Table 6 represents the final model considered for bachelor degree attainment after stepwise removal of the other predictor variables. The initial model can be found in Appendix B.

Table 6 Bachelor Degree Attainment First-Generation Definition One Logistic Regression

Predictor	***b***	***se***	***z*-value**	***p*-value**	**Odds ratio**
Hours worked in college	- 0.02	0.003	-8.81	<.001	0.98
Cumulative loan debt	<.001	<.001	5.47	<.001	1.00
Female	0.29	0.07	4.07	<.001	1.34
Underrepresented	- 0.33	0.09	-3.94	<.001	0.72
Initial attendance pattern	0.58	0.11	4.49	<.001	1.61
High school GPA	1.06	0.06	9.03	<.001	1.78
Cumulative GPA	1.06	0.05	20.65	<.001	2.90
Tuition	<.001	<.001	6.98	<.001	1.00
Household income	<.001	<.001	6.83	<.001	1.00
First-generation definition one	- 0.27	0.09	-2.31	.02	0.81
Observations	4582				
Pseudo R^2	0.20				
Intercept	-3.23				

Table 6 includes findings that are largely consistent with prior research examining graduation for first-generation students. Factors that were negatively associated with degree completion include working more hours while in college, identifying as an underrepresented student, and being a first-generation student whose parents did not attend college. Each of these were significant at the $p<.001$ level with the exception of first-generation status, which was significant at the $p<.05$ level. Students who identified as underrepresented were 28% less likely to achieve a bachelor's degree, and students whose parents did not attend college were 19% less likely to achieve a bachelor's degree. For each additional hour a student worked per week, students were 2% less likely to complete their bachelor's degree.

Students were more likely to complete a bachelor's degree if they took on loan debt, were female, attended full time during their first semester, had higher high school and cumulative postsecondary GPAs, and paid more in tuition. Many of these variables had small effect sizes on a student's overall graduation odds, however. The beta coefficients and odds ratios were recalculated for cumulative loan, household income, and tuition to allow for stronger interpretation and because when a $1 increase in any of those factors was considered, the impact on the odds ratio was negligible. The beta coefficient for cumulative loan was multiplied by $1000, as the average loan debt for students was just over $10,000. With this recalculation, we can say that for each additional $1000 a student takes on in loan debt, they are 1.01 times more likely to graduate. Thus, we can still say that the effect of taking on loan debt in relation to it being a positive contributor to bachelor's degree attainment is actually quite small. The effect sizes are not much greater for household income and tuition, which contributed to

students having greater odds of graduating at 1.06 (for each additional $10,000 of household income) and 1.08 (for each $1000 additional tuition dollars paid), respectively.

The greatest impact on graduation was increasing a student's self reported overall cumulative postsecondary GPA. For each unit increase in GPA, students had 170% greater odds of completing a bachelor's degree. This finding mirrors that of Martinez et al. (2009) who noted in their single institution study that students identifying as first-generation and students with lower cumulative GPAs complete college at a lower rate; this specific interaction was not examined in this study.

After the final regression model was determined, a Fairlie decomposition was run to examine the impact of the primary independent variable of interest, first-generation definition one. In this analysis, first-generation definition one was determined to explain 13% of the overall variance in the model. This is considered a low amount of variance for this metric (Cohen, 1988).

Figure 2 depicts the model in terms of the relationship between household income, first-generation, and underrepresented status with the odds of degree attainment.

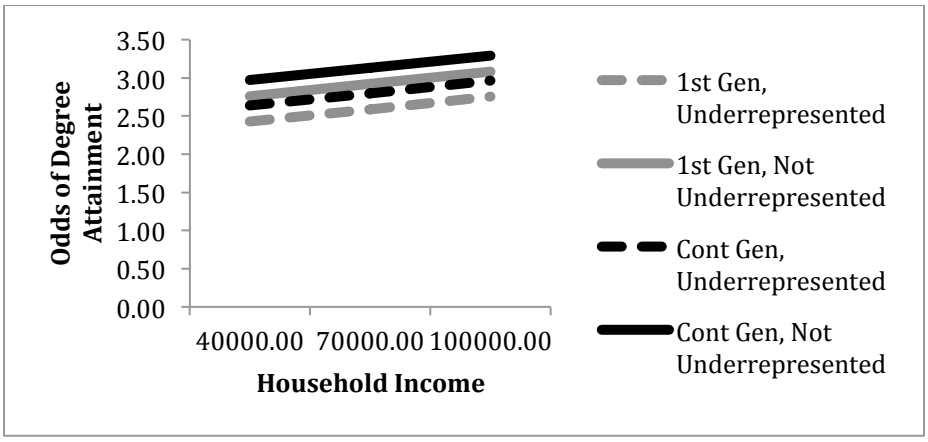

Figure 2. A graphic depicting the relationship between first-generation definition one, underrepresented status, household income, and overall odds of degree attainment.

All other variables were kept at the mean. For every category, the odds of degree attainment increase as household income increases. The odds of degree attainment are lower for first-generation, underrepresented students. Also of interest in Figure 2 is that first-generation, not underrepresented students have greater odds of degree attainment when compared to their continuing-generation, underrepresented peers.

First-generation definition two: Parents with less than an associate's degree. The second model considers first-generation definition two, which includes students whose parents completed some college but did not earn a degree (*n*=510). The independent variables considered in this model are the same for each of the models examining bachelor degree attainment and can be found in Table 2. Table 7 represents the final model considered for bachelor degree attainment after stepwise removal of the other predictor variables. The initial model can be found in Appendix B.

Table 7 Bachelor Degree Attainment First-Generation Definition Two Logistic Regression

Predictor	***b***	***se***	***z*-value**	***p*-value**	**Odds ratio**
Hours worked in college	-0.02	0.003	-8.63	<.001	0.98
Cumulative loan debt	<.001	<.001	5.64	<.001	1.00
Female	0.30	0.07	4.15	<.001	1.35
Underrepresented	-0.33	0.09	-3.92	<.001	0.72
Initial attendance pattern	0.48	0.11	4.52	<.001	1.62
High school GPA	0.58	0.06	9.02	<.001	1.78
Cumulative GPA	1.06	0.05	20.56	<.001	2.89
Tuition	0.003	<.001	6.89	<.001	1.00
Household income	<.001	<.001	6.37	<.001	1.00
First-generation definition two	-0.30	0.08	-3.91	<.001	0.74
Observations	4582				
Pseudo R^2	0.21				
Intercept	-3.15				

Table 7 illustrates that using a different definition of first-generation, definition two, has a minimal effect on the model. The overall odds increased by .01 for initial attendance pattern and students identifying as female, but all other odds remained the same with the exception of the first-generation variable. When examining how first-generation definition two differed from first-generation one in terms of bachelor's degree attainment, students whose parents attended some college but did not attain a credential were 7% less likely to attain a bachelor's degree as compared to their peers whose parents attended no college. Thus, students identifying as first-generation definition two are 26% less likely than their peers to achieve a bachelor's degree.

After the final regression model was determined, a Fairlie decomposition was run to examine the impact of the primary independent variable of interest, first-generation definition two. In this analysis, first-generation definition two was determined to explain 12% of the overall variance in the model. This is considered a low amount of variance for this metric (Cohen, 1988).

Figure 3 depicts the regression model in terms of the relationship between household income, first-generation definition two, and underrepresented status with the odds of degree attainment. All other variables were kept at the mean. As can be seen, for every category, the odds of degree attainment increase as household income increases. The odds of degree attainment are lower for first-generation, underrepresented students. Also of interest in Figure 3, especially because this relationship is not demonstrated as clearly in the regression model itself, is that first-generation, not underrepresented students have almost equal odds of degree attainment as continuing-generation, underrepresented students.

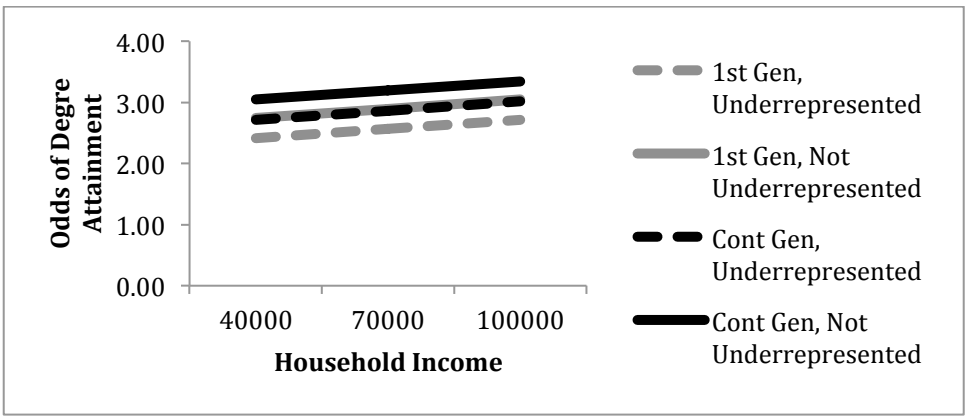

Figure 3. A graphic depicting the relationship between first-generation definition two, underrepresented status, household income, and overall odds of degree attainment.

First-generation definition three: Parents with a certificate or an associate's degree but less than a bachelor's degree. The final model considers first-generation definition three, which includes students whose parents completed an associates degree or certificate but did not attain a 4-year, bachelor's degree (*n*=520). The independent variables considered in this model are the same for each of the models examining bachelor degree attainment and can be found in Table 2. Table 8 represents the final model considered for bachelor degree attainment after stepwise removal of the other predictor variables. The initial model can be found in Appendix B.

Table 8 Bachelor Degree Attainment First-Generation Definition Three Logistic Regression

Predictor	***b***	***se***	***z*-value**	***p*-value**	**Odds ratio**
Hours worked in college	-0.024	0.003	-8.40	<.001	0.98
Cumulative loan	<.001	<.001	5.80	<.001	1.00
Female	0.30	0.07	4.25	<.001	1.36
Underrepresented	-0.32	0.09	-3.79	<.001	0.72
Initial attendance pattern	0.49	0.11	4.58	<.001	1.63
High school GPA	0.58	0.06	9.07	<.001	1.78
Cumulative GPA	1.06	0.05	20.53	<.001	2.89
Tuition	<.001	<.001	6.77	<.001	1.00
Household income	<.001	<.001	6.05	<.001	1.00
First-generation definition three	-0.36	0.08	-4.47	<.001	0.70
Observations	4582				
Pseudo R^2	0.21				
Intercept	-3.1				

The inclusion of first-generation definition three, those students with parents who attended college and attained a credential less than a bachelor's degree, also had minimal effects on the overall model. The exception with this model is that students who identified as first-generation definition three were even less likely to attain a bachelor's degree with these students 30% less likely than their continuing-generation peers to attain a bachelor's degree. This finding is contrary to what I thought would be found with first-generation definition three as most studies (Amelink, 2005; Hirudayaraj, 2011; Horn & Nuñez 2000; Inman & Mayes, 1999; Ishintani, 2006; Lohfink & Paulsen, 2005; McCarron & Inkelas, 2006; Nuñez & Cuccaro-Alamin, 1998; Saenz, 2007; Somers, Woodhouse, & Cofer, 2004; Warburton, et al., 2001) conceptualize first-generation as neither parent attending college, and the additional students in definition three have parents who have attained a certificate or an associates degree.

This finding supports using the TRiO definition of first-generation of neither parent attaining a bachelor's degree as the most desirable first-generation definition. This definition includes the largest group of students who would benefit from additional supports. In every model considering graduation and cumulative loan debt, all three definitions of first-generation were significantly different from the average, which demonstrates the need for a more inclusive definition of first-generation. Because this finding is different from the majority of research defining first-generation as neither parent having attended college (Amelink, 2005; Hirudayaraj, 2011; Horn & Nuñez 2000; Inman & Mayes, 1999; Ishintani, 2006; Lohfink & Paulsen, 2005; McCarron & Inkelas, 2006; Nuñez & Cuccaro-Alamin, 1998; Saenz, 2007; Somers, et al., 2004; Warburton, et al., 2001), it is important to test whether this finding is consistent across future studies.

After the final regression model was determined, a Fairlie decomposition was run to examine the impact of the primary independent variable of interest, first-generation definition three. In this analysis, first-generation definition three was determined to explain 11% of the overall variance in the model. This is considered a low amount of variance for this metric (Cohen, 1988).

Figure 4 depicts the regression model in terms of the relationship between household income, first-generation definition three, and underrepresented status with the odds of degree attainment. All other variables were kept at the mean. For every category, the odds of degree attainment increase as household income increases. The odds of degree attainment are lower for first-generation, underrepresented students. The finding that underrepresented students have almost equal odds of degree attainment as continuing-generation, underrepresented students is almost identical to the relationship demonstrated above for first-generation definition two.

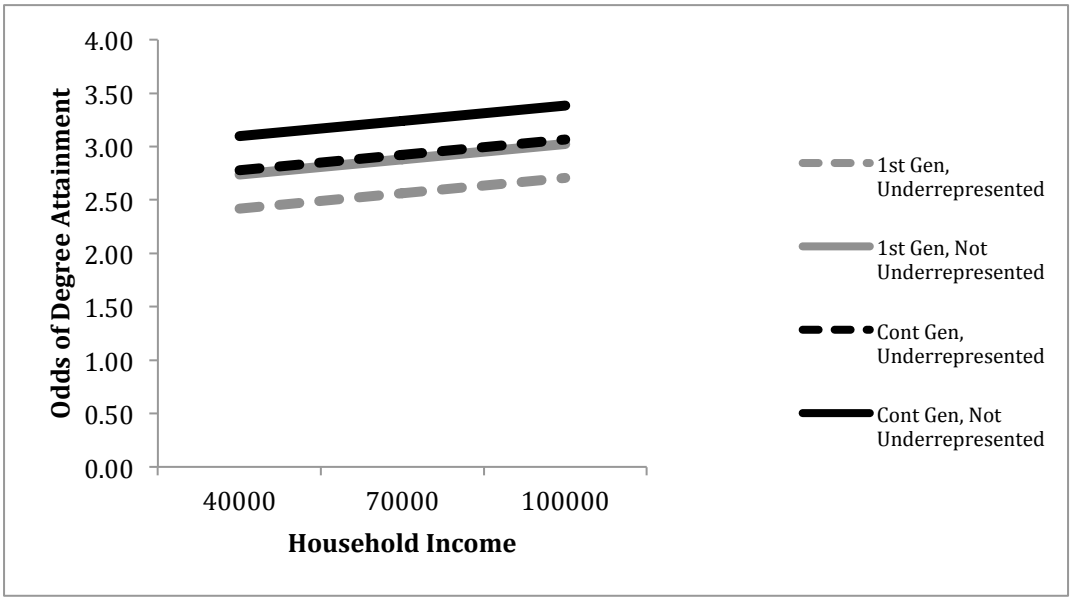

Figure 4. A graphic depicting the relationship between first-generation definition three, underrepresented status, household income, and overall odds of degree attainment.

Cumulative Loan Debt as the Outcome Variable

The second educational outcome to be explored is cumulative student loan debt in 2009. Because cumulative loan debt is a continuous variable, the regression model used to examine this outcome variable was an OLS regression. The complete set of assumptions can be found in Appendix A.

Of the 4582 students included in the analysis, over half had accumulated loan debt at the time of graduation. First-generation students had loan debt at percentages higher than the overall average, and students whose parents had attended some college or who had received a degree or certificate less than a bachelor's degree had higher average loan debt than individuals whose parents never attended college. The paragraphs below discuss all definitions of first-generation and their relationships with the outcome variable of cumulative loan debt in 2009.

First-generation definition one. The first model considers first-generation definition one, which includes students whose parents did not attend college (n=865). The independent variables considered in this model are the same for each of the models examining bachelor degree attainment with the exception of also including the bachelor degree attainment variable as a predictor variable in this model and can be found in Table 2. Table 9 represents the final model considered for cumulative loan debt after stepwise removal of the other predictor variables. The initial model can be found in Appendix B.

As the dependent variable of cumulative loan debt was logged, the beta coefficients were interpreted at 100*coefficient (Institute for Digital Research and Education, 2015). This allowed for the coefficients to be interpreted in terms of percentage change in loan debt for a one-unit change in the independent variable instead

Table 9 Cumulative Loan at Graduation First-Generation Definition One OLS Regression

Predictor	***b***		***se***	***t*-value**	***p*-value**
Age	-0.100		0.020	-4.61	<.001
Hours worked in college	0.020		0.010	3.96	<.001
Underrepresented	0.480		0.170	2.87	.004
Asian	-1.630		0.290	-5.61	<.001
Initial attendance	0.670		0.210	3.25	.001
Cumulative GPA	0.320		0.090	3.39	.001
Tuition	<.001		<.001	4.53	<.001
Household income	<.001		<.001	-13.87	<.001
First-generation definition 1	0.860		0.180	4.92	<.001
Observations	4582				
Intercept	7.26				
R^2	0.08				
Model *F*-statistic	43.12	***			

Note: *p*-value < .001 ***, .01 **, .05 *

of logged dollars for the monetary related variables. For the three models examining cumulative loan debt, those calculations were taken into account. In the first model, first-generation students in definition one had approximately 86% more loan debt than their continuing-generation peers. This variable showed the largest difference in terms of loan debt percent increases.

Underrepresented students had on average 48% more loan debt than their peers, and students attending college full time during their first semester had 67% more debt than their continuing-generation peers. Individuals with higher GPAs also had higher loan debt with a 32% increase in loan debt for each categorical increase in cumulative GPA. For each hour worked at a job while in college, students had approximately 2% more debt. For each dollar that an individual paid in tuition, they could expect to have approximately .08 more loan debt. Three variables equated with less loan debt: age, if a student was Asian, and household income. For each year increase in age, a student would have approximately 10% less debt. Asian students had 163% less debt than their non-Asian peers, and students with lower household incomes could expect to have more debt.

After the final regression model was determined, a Blinder Oaxaca decomposition was run to examine the impact of the primary independent variable of interest, first-generation definition one. In this analysis, first-generation definition one was determined to account for .51 or 40% of the overall -1.28 logged cumulative loan gap. This is considered a moderate amount of variance for this metric (Cohen, 1988).

Figure 5 depicts the regression model in terms of the relationship between household income, first-generation definition one, and underrepresented status with logged cumulative loan at graduation. All other variables were kept at the mean. For every category, the amount of cumulative loan debt decreases as household income increases. Continuing-generation students have less loan debt while underrepresented, continuing-generation students have slightly more loan debt than their Asian and Caucasian peers. First-generation students have greater amounts of loan debt compared to their continuing-generation peers; first-generation, underrepresented students have slightly more debt than students who are not underrepresented.

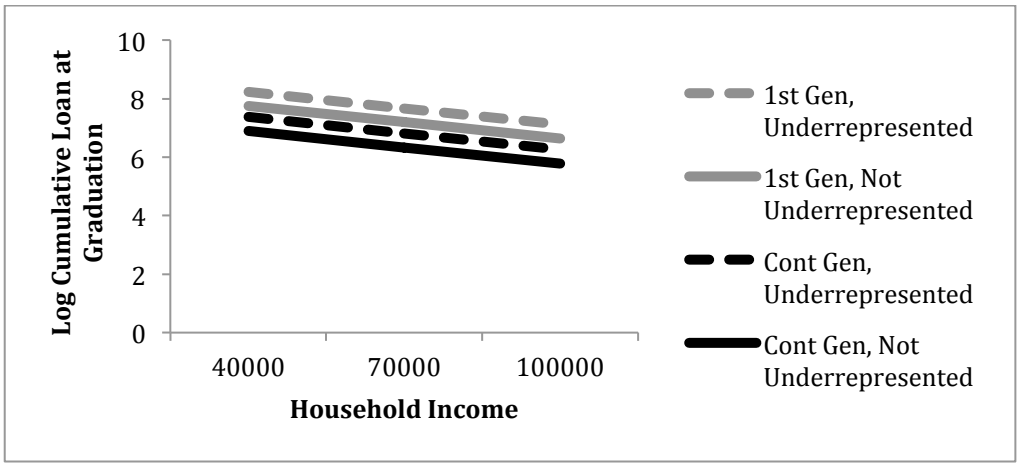

Figure 5. A graphic depicting the relationship between first-generation definition one, underrepresented status, household income, and overall loan debt at 6 years after starting college.

First-generation definition two. The second model considers first-generation definition two, which includes students whose parents completed some college but no degree (*n*=510). The independent variables considered in this model are the same for each of the models examining bachelor degree attainment with the exception of also including the bachelor degree attainment variable as a predictor variable in this model and can be found in Table 2. Table 10 illustrates the final model considered for cumulative loan debt after stepwise removal of the other predictor variables. The initial model can be found in Appendix B.

Removing first-generation definition one and replacing it with first-generation definition two impacted the model very little. However, the percent of debt for first-generation definition two was much greater than that of first-generation definition one. Students identifying as individuals whose parents attended some college but had not received a degree or certificate had 128% more loan debt than their continuing-generation peers.

Table 10 Cumulative Loan at Graduation First-Generation Definition Two OLS Regression

Predictor	***b***	***se***	***t*-value**	***p*-value**
Age	-0.10	0.01	3.64	<.001
Hours worked in college	0.02	0.02	-4.82	<.001
Underrepresented	0.46	0.17	2.78	.006
Asian	-1.59	0.29	-5.50	<.001
Initial attendance	0.66	0.21	3.20	.001
Cumulative GPA	0.34	0.09	3.66	<.001
Tuition	<.001	<.001	4.73	<.001
Household income	<.001	<.001	-12.72	<.001
First-generation definition two	1.28	0.15	8.47	<.001
Observations	4582			
Intercept	6.97			
R^2	0.09			
Model *F*-statistic	48.83 ***			

Note: *p*-value < .001 ***, .01 **, .05 *

After the final regression model was determined, a Blinder Oaxaca decomposition was run to examine the impact of the primary independent variable of interest, first-generation definition two. In this analysis, first-generation definition two was determined to account for .53 or 31% of the overall -1.71 logged cumulative loan gap. This is considered a moderate amount of variance for this metric (Cohen, 1988).

Figure 6 depicts the regression model in terms of the relationship between household income, first-generation definition two, and underrepresented status with logged cumulative loan at graduation. All other variables were kept at the mean. As can be seen in Figure 6, for every category, the amount of cumulative loan debt decreases as household income increases. Continuing-generation students have less loan debt; underrepresented, continuing-generation students have slightly more loan debt than their Asian and Caucasian peers. First-generation students have greater amounts of loan debt compared to their peers with a slightly larger gap between first- and continuing-generation loan debt than was evident in the model for first-generation definition one.

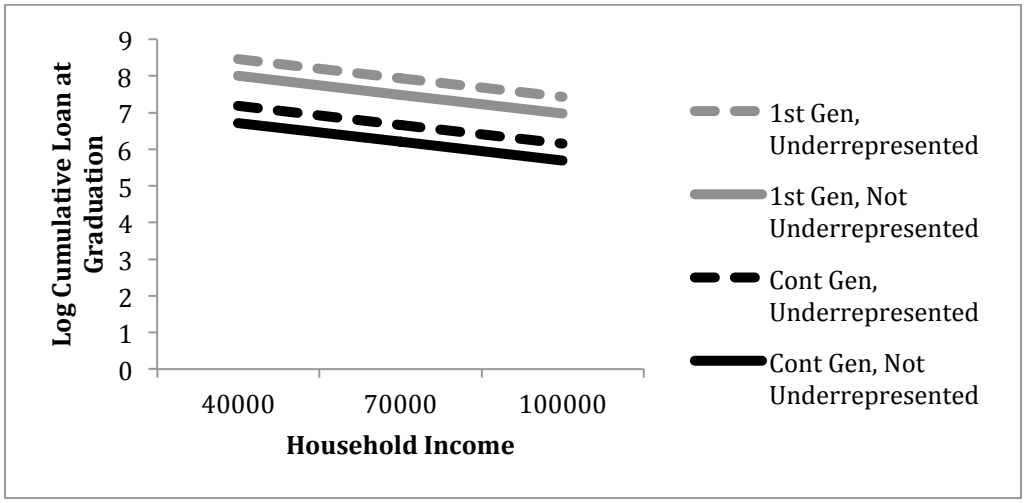

Figure 6. A graphic depicting the relationship between first-generation definition two, underrepresented status, household income, and overall loan debt at 6 years after starting college.

First-generation definition three. The final model considers first-generation definition three, which includes students whose parents completed an associates degree or certificate but did not attain a 4-year, bachelor's degree (*n*=520). The independent variables considered in this model are the same for each of the models examining bachelor degree attainment with the exception of also including the bachelor degree attainment variable as a predictor variable in this model and can be found in Table 2.

Table 11 represents the final model considered for cumulative loan debt after stepwise removal of the other predictor variables. The initial model can be found in Appendix B. The model was impacted very little by the removal of first-generation definition two and replacing it with first-generation definition three. In fact, both first-generation two and three both had 128% more loan debt than their continuing-generation peers. These findings demonstrate that while students in all definitions of first-generation have more debt than their peers, those whose parents did not attend college had less debt than first-generation definitions two and three.

Table 11 Cumulative Loan at Graduation First-Generation Definition Three OLS Regression

Predictor	***b***	***se***	**t-value**	**p-value**
Age	-0.09	0.01	3.33	.001
Hours worked in college	0.02	0.02	-4.50	<.001
Underrepresented	0.44	0.17	2.63	.009
Asian	-1.53	0.29	-5.32	<.001
Initial attendance	0.64	0.21	3.14	.002
Cumulative GPA	0.34	0.09	3.64	<.001
Tuition	<.001	<.001	4.94	<.001
Household income	<.001	<.001	-12.21	<.001
First-generation definition three	1.28	0.14	8.94	<.001
Observations	4582			
Intercept	6.67			
R^2	0.09			
Model *F*-statistic	49.81 ***			

Note: *p*-value < .001 ***, .01 **, .05 *

After the final regression model was determined, a Blinder Oaxaca decomposition was run to examine the impact of the primary independent variable of interest, first-generation definition three. In this analysis, first-generation definition one was determined to have accounted for .6 or 34% of the overall -1.77 logged cumulative loan gap. This is considered a moderate amount of variance for this metric (Cohen, 1988).

Figure 7 depicts the regression model in terms of the relationship between household income, first-generation definition three, and underrepresented status with logged cumulative loans at graduation. All other variables were kept at the mean. As can be seen in Figure 7, for every category, the amount of cumulative loan debt decreases as household income increases. Continuing-generation students have less loan debt; underrepresented, continuing-generation students have slightly more loan debt than their peers. The gap between first- and continuing-generation student debt is very similar to that for first-generation definition two and greater than the gap shown for first-generation definition one.

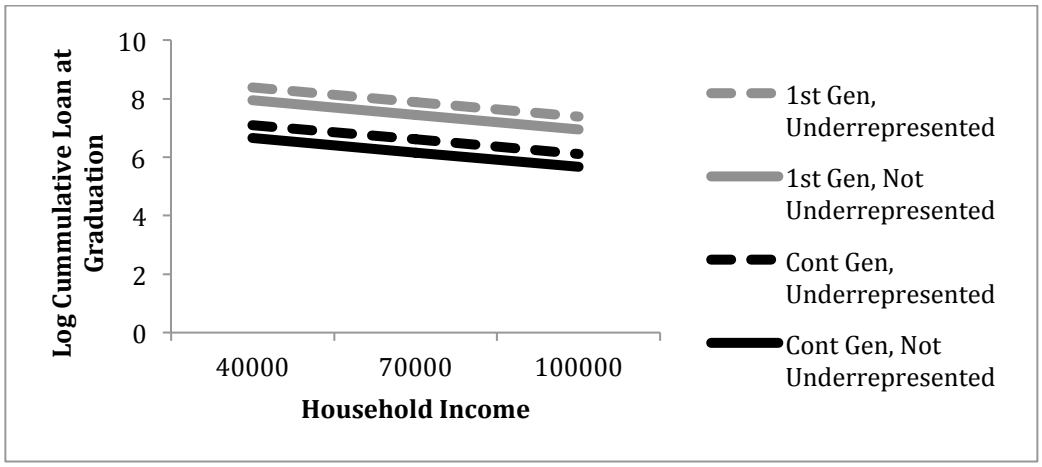

Figure 7. A graphic depicting the relationship between first-generation definition three, underrepresented status, household income, and overall loan debt at 6 years after starting college.

Employment as the Outcome Variable

The final educational outcome explored is employment. This outcome was coded dichotomously as not currently employed or currently employed. Individuals were not included if they were still enrolled in a degree program in any capacity. With that definition, over 80% of all students were employed in 2009 with no large differences between first-generation students and the overall average with the exception of individuals identifying in the third first-generation category having a slightly higher employment percentage compared to the other categories. The paragraphs below discuss all definitions of first-generation and their relationships with the outcome variable of employment at the end of the 6-year period included in the study, 2009.

First-generation definition one. The first model considers first-generation definition one, which includes students whose parents did not attend college (*n*=865). The independent variables considered in this model can be found in Table 2. Table 12 represents the final model considered for employment after stepwise removal of the other predictor variables. The initial model can be found in Appendix B.

Table 12 Employment After Graduation First-Generation Definition One Logistic Regression

Predictor	***b***	***se***	***z*-value**	***p*-value**	**Odds ratio**
Hours worked in college	0.01	<.001	2.92	.003	1.01
Bachelor degree	0.36	0.16	3.21	.001	1.44
Initial attendance	0.31	0.19	2.22	.026	1.36
Cumulative GPA	0.39	0.10	5.76	<.001	1.47
First-generation definition one	0.04	0.13	0.30	.770	1.04
Observations	4582				
Pseudo R^2	0.03				
Intercept	1.05				

While the factors included in the employment regression models were the same as those used in the bachelor degree attainment models, they were not as good at predicting employment. Each model accounted for only 3% of the overall variance. For each additional hour that students worked at a job while in college, they had 1% greater odds of being employed in 2009; the more hours students worked, the greater odds they had of being employed. Four of the greatest predictors of employment were the following: attaining a bachelor's degree ($p<.01$); if a student was enrolled full time during their first semester; cumulative postsecondary GPA ($p<.001$); and number of hours worked while in college. Attaining a bachelor's degree increased the odds of employment by 44%; if a student was enrolled full time during their first semester, they had 36% greater odds of employment than if they were enrolled part time, and with each increase in GPA category a student had 47% greater odds of graduating. Finally, for each additional hour a student worked in college, their odds of employment after graduation increased by 1%. Thus, if a student worked 20 hours a week during college, their odds of getting a job increased by 20%. First-generation definition one was not a significant predictor of employment after graduation.

After the final regression model was determined, a Fairlie decomposition was run to examine the impact of the primary independent variable of interest, first-generation definition one. In this analysis, first-generation definition one was determined to explain only 1% of the overall variance in the model, which makes sense because this factor was not significant in the final model.

First-generation definition two. The second model considers first-generation definition two, which includes students whose parents completed some college but no

degree (n=510). The independent variables considered in this model are the same for each of the models examining bachelor degree attainment with the exception of also including the bachelor degree attainment variable as a predictor variable in this model and can be found in Table 2. Table 13 represents the final model considered for employment after stepwise removal of the other predictor variables. The initial model can be found in Appendix B.

The model was impacted very little by the removal of first-generation definition one and replacing it with first-generation definition two. However, in this model, household income was shown to be a predictor of employment. This was the only model in which household income was significant. After recalculating the beta coefficient and corresponding odds ratio, it was found that for each $10,000 increase in household income, the odds of getting a job increased by 2%.

After the final regression model was determined, a Fairlie decomposition was run to examine the impact of the primary independent variable of interest, first-generation definition two. In this analysis, first-generation definition two was determined to explain only .08% of the overall variance in the model, which makes sense, as this factor was not significant in the model.

Table 13 Employment After Graduation First-Generation Definition Two Logistic Regression

Predictor	***b***	***se***	***z*-value**	***p*-value**	**Odds ratio**
Hours worked in college	0.01	<.001	3.00	.003	1.01
Bachelor degree	0.34	0.11	2.97	.003	1.41
Initial attendance	0.31	0.14	2.27	.023	1.37
Cumulative GPA	0.38	0.07	5.73	<.001	1.48
Household income	<.001	<.001	2.12	.034	1.00
First-generation definition two	0.15	0.11	1.38	.169	1.16
Observations	4582				
Pseudo R^2	0.03				
Intercept	0.84				

First-generation definition three. The final model considers first-generation definition three, which includes students whose parents completed an associates degree or certificate but did not attain a 4-year, bachelor's degree (*n*=520). The independent variables considered in this model are the same for each of the models examining bachelor degree attainment with the exception of also including the bachelor degree attainment variable as a predictor variable in this model and can be found in Table 2. Table 14 represents the final model considered for employment after stepwise removal of the other predictor variables was completed. The initial model can be found in Appendix B.

As with the other employment models, cumulative GPA was the best predictor of employment status for this model. Also consistent with the other two models, first-generation definition three was not significant in this model. As such, we can conclude that with the variables considered in the three employment models, first-generation status is not a significant predictor of employment no matter which definition of first-generation is used.

Table 14 Employment After Graduation First-Generation Definition Three Logistic Regression

Predictor	***b***	***se***	***z*-value**	***p*-value**	**Odds ratio**
Hours worked in college	0.01	<.001	2.90	.004	1.01
Bachelor degree	0.37	0.11	3.23	.001	1.44
Initial attendance	0.30	0.14	2.19	.029	1.35
Cumulative GPA	0.38	0.07	5.74	<.001	1.47
First-generation definition three	0.21	0.17	1.25	.210	1.23
Observations	4582				
Pseudo R^2	0.03				
Intercept	1.04				

After the final regression model was determined, a Fairlie decomposition was run to examine the impact of the primary independent variable of interest, first-generation definition three. In this analysis, first-generation definition three was determined to explain only 1% of the overall variance in the model, which makes sense because this factor was not significant in the model.

Research Question Two: Debt to Income Ratio

The second research question considered how first-generation students differ from their continuing-generation peers in terms of their debt to income ratio in 2009 and whether that level of debt is manageable. OLS regressions were run for each of the first-generation definitions, and only the 2,590 students who had debt were included. For purposes of this study, the log of the cumulative loan variable was used as this provided a more normal distribution of the variable as indicated after considering the ladder of powers (Tukey, 1977). The models were not very strong and explained only 4% of the variance. Because so little variance was accounted for and because the primary independent variable to consider, first-generation status, was not significant for any of the three definitions considered, I have not included these models in the dissertation text. The initial and final models for all three first-generation definitions can be found in Appendix B.

The conclusion can be drawn that the answer to the first part of research question two is that there is no significant difference between first-generation students and their peers or between any of the three first-generation definitions in terms of the overall debt to income ratio. With the inclusion of additional variables and potentially a different analysis, these findings could be different. I recommend that this be considered in future

research. Table 5 demonstrates the differences in the amount of debt, average employment salary, and reported average debt to income ratio for each definition of first-generation.

Research Question Three: Interaction Between First-Generation, Household Income, and Race/Ethnicity

The third research question explores the interaction between first-generation status, household income, and race and ethnicity. Prior research has shown that many students who identify in one of these categories also identify in another of them (Bui, 2002; Horn & Nunez, 2000; Nunez & Cuccaro-Alamin, 1998; Saenz, 2007; Terenzini, et al., 1996). Interactions were considered for each definition of first-generation, household income, and underrepresented status. Regressions were run for each of the nine interaction models considered. While three-way interactions were considered between first-generation status, race/ethnicity, and household income, none were found to be significant. Only those models with significant findings are included. All initial models can be found in Appendix B.

First-Generation Definition One and Household Income

A statistically significant interaction ($p<.001$) was found between household income and students whose parents did not attend college in terms of the amount of loan deb accumulated. The final model is shown in Table 15, and the initial model can be found in Appendix B.

Statistical significance was also found for the amount of cumulative loan debt that these students had in 2009. The model accounted for 5% of the variance in loan debt.

Table 15 Cumulative Loan Interaction First-Generation Definition One OLS Regression

Predictor	***b***	***se***	***t*-value**	***p*-value**
Household income	<.001	<.001	-14.06	<.001
First-generation definition one	0.05	0.27	0.17	.86
First-generation definition one * income	<.001	<.001	3.06	<.001
Observations	4594			
Intercept	7.27			
R^2	0.05			
Model *F*-statistic	86.09	***		

Note: *p*-value < .001 ***, .01 **, .05 *

Figure 8 shows this relationship graphically. As seen in Figure 8, individuals from families with lower household incomes have greater amounts of cumulative loan debt. At the lowest levels of household income, continuing-generation and first-generation definition one students have similar amounts of loan debt. First-generation definition one students consistently have greater amounts of loan debt than their continuing-generation peers even at higher income levels. It is important to note that this graph shows only those students who have taken on loan debt and excludes those with no loan debt.

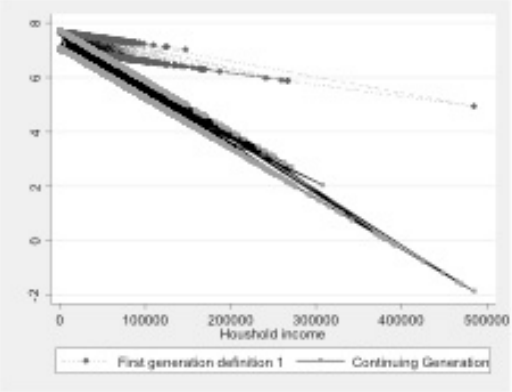

Figure 8. A graphic depicting the interaction between first-generation definition one, continuing-generation status, household income, and cumulative loan debt.

First-Generation Definition One and Underrepresented Race/Ethnicity

A statistically significant relationship was found between underrepresented status and first-generation status. The model accounted for only 2% of the variance in degree attainment. The final model is shown in Table 16, and the initial model can be found in Appendix B.

Figure 9 shows this relationship graphically. As seen in Figure 9, individuals who are underrepresented are less likely to attain a bachelor's degree. However, if they also identify as first-generation, they are less likely to attain a degree.

Table 16 Bachelor Degree Interaction First-Generation Definition One Logistic Regression

Predictor	***b***	***se***	***z*-value**	***p*-value**	**Odds ratio**
Underrepresented	-0.64	0.08	-7.58	<.001	0.53
First-generation definition one	-0.77	0.09	-8.58	<.001	0.46
Underrepresented * first-generation definition one	0.50	0.17	3.04	.002	1.66
Observations	4594				
Intercept	0.75				
R^2	0.02				

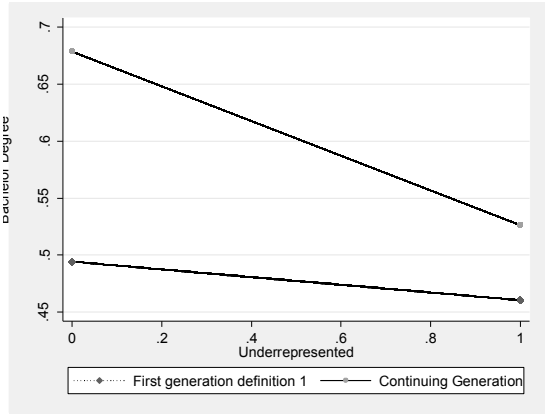

Figure 9. A graphic depicting the interaction between first-generation definition one, continuing-generation status, underrepresented status, and bachelor degree attainment.

First-Generation Definition Two and Household Income

A statistically significant interaction (p<.05) was found between household income and students whose parents attended college but did not attain a degree. The final model is shown in Table 17, and the initial model can be found in Appendix B.

The model accounted for 6% of the variance in loan debt. Figure 10 shows this relationship graphically. As seen in Figure 10, individuals coming from families with lower household incomes have greater amounts of cumulative loan debt. At the lowest levels of household income, continuing-generation and first-generation definition two students have similar amounts of loan debt, although first-generation definition two does have slightly higher debt even at the lowest level. First-generation definition two students consistently have greater amounts of loan debt than their continuing-generation peers even at higher income levels. It is important to note that this graph only shows students who have taken on loan debt and excludes those with no loan debt.

Table 17 Cumulative Loan Interaction First-Generation Definition Two OLS Regression

Predictor	***b***	***se***	***t*-value**	***p*-value**
Household income	<.001	<.001	-12.39	<.001
First-generation definition two	0.66	0.24	2.71	.01
First-generation definition two * income	<.001	<.001	2.69	.007
Observations	4594			
Intercept	6.95			
R^2	0.06			
Model F-statistic	100.88	***		

Note: p-value < .001 ***, .01 **, .05 *

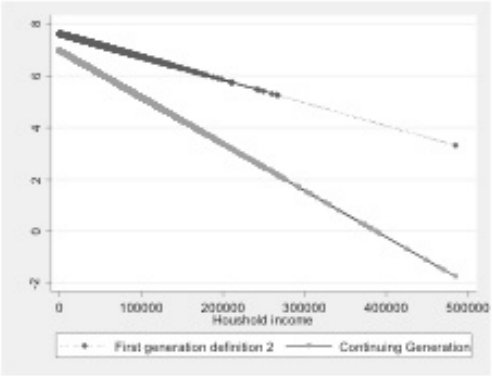

Figure 10. A graphic depicting the interaction between first-generation definition two, continuing-generation status, household income, and cumulative loan debt.

First-Generation Definition Two and Underrepresented Race/Ethnicity

A statistically significant interaction (p<.05) was found between underrepresented status and first-generation status. The model accounted for 3% of the variance in degree attainment. The final model is shown in Table 18, and the initial model can be found in of Appendix B.

The graphic model of this interaction mirrors that of Figure 9. Individuals who identify as underrepresented are less likely to attain a bachelor's degree whether or not they are first-generation. However, if they also identify as first-generation two, they are even less likely to attain a degree.

Table 18 Bachelor Degree Interaction First-Generation Definition Two Logistic Regression

Predictor	***b***	***se***	***z*-value**	***p*-value**	**Odds ratio**
Underrepresented	-0.64	0.09	-6.91	<.001	0.52
First-generation definition two	-0.74	0.08	-9.73	<.001	0.48
Underrepresented * first-generation definition two	0.37	0.15	2.47	.013	1.45
Observations	4594				
Intercept	0.83				
R^2	0.03				

First-Generation Definition Three and Underrepresented Race/Ethnicity

A statistically significant interaction (p<.01) was found between underrepresented status and first-generation definition three. The model accounted for 3% of the variance in degree attainment. The final model is shown in Table 19, and the initial model can be found in Appendix B.

Figure 11 shows this relationship graphically. As seen in Figure 11, individuals who are underrepresented are less likely to attain a bachelor's degree whether or not they are first-generation.

Table 19 Bachelor Degree Interaction First-Generation Definition Two Logistic Regression

Predictor	***b***	***se***	***z*-value**	***p*-value**	**Odds ratio**
Underrepresented	-0.70	0.11	-6.56	<.001	0.49
First-generation definition three	-0.77	0.07	-10.77	<.001	0.46
First-generation definition three*underrepresented	0.43	0.15	2.91	0.004	1.53
Observations	4594				
Intercept	0.93				
R^2	0.03				

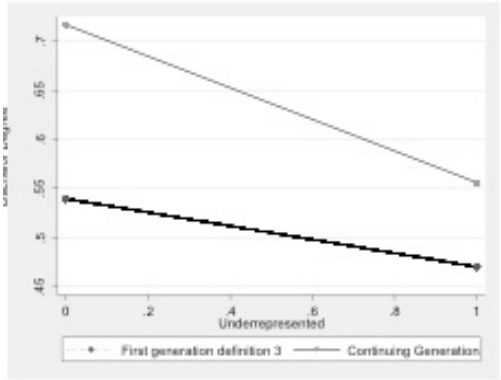

Figure 11. A graphic depicting the interaction between first-generation definition three, continuing-generation status, underrepresented status, and bachelor degree attainment.

While this study revealed no significant interactions between first-generation status, income, and underrepresented status, findings did show significant interactions between first-generation status and income and first-generation status and underrepresented status. For each interaction explored, if a student identified as underrepresented and first-generation definition one, two, or three, they were less likely than their continuing-generation peers to graduate. If a student was first-generation one or two, they were more likely to have a greater amount of loan debt as their household income decreased. The interaction between loan debt and household income was not significant for first-generation definition three.

CHAPTER V

DISCUSSION

In this chapter, the significant findings from this study are organized into three sections. The first section provides a summary of the findings and how those findings complement or add to existing research in the field. The next section explores the implications of this study for practice and policy, and the final section makes recommendations for future research in the area of first-generation college students and their educational outcomes.

Discussion of Findings

The summary of findings is broken down by research question with the first subsection exploring the educational outcomes of graduation, cumulative loan debt at graduation, and employment at graduation. The next section examines research question two concerning the differences in the debt to income ratio for first- and continuing-generation students, and the final section explores the interactions between the first-generation, race and ethnicity, and household income variables in terms of their relationship with the educational outcomes.

First-Generation Educational Outcomes

The first research question explored educational outcome attainment and how that differs for first- and continuing-generation students. To discuss the educational outcome

findings, the following sections consider graduation, cumulative loan debt, and employment.

Graduation. When considering the first research question of how first-generation students differ from their continuing-generation peers in terms of their educational outcomes, it was found that first-generation students in every category have lower graduation rates than their peers. In fact, the magnitude of the disparity in graduation rates gets larger as the definition of first-generation students is broadened. This may be because of confounding factors as more students are added. These variables could be poverty level or type of financial aid received such as scholarships versus grants. However, regardless of the underlying factors, it is evident that no matter what the definition, first-generation students graduate at rates much lower than their continuing-generation peers. The finding that underrepresented students and those with lower household incomes graduate at even lower rates is consistent with the findings of Ishintani (2006) and those of McCarron and Inkleas (2006).

Cumulative loan debt. The second educational outcome for first-generation students explored in this study was cumulative loan debt. Contrary to prior research on first-generation students being loan averse (Burdman, 2005), first-generation students in this study took on more loan debt than their continuing-generation peers for every definition of first-generation. It is important to note that most of the studies in the literature review examined loan debt for low-income students (Campaigne & Hossler, 1998; Engle & Tinto, 2008; Lohfink & Paulsen, 2005; Lundberg, et al., 2007; Somers, et al., 2004), and while many first-generation students do also identify as low-income, low-income students were not specifically explored in this study. First-generation definition

one students, those students whose parents did not attend college, did carry less loan debt than students in first-generation definitions two and three with $624 more debt, on average, than their continuing-generation peers. Students in first-generation definitions two and three had, on average, $1805 more debt than their continuing-generation peers. These numbers are especially important to consider because each category of first-generation students graduates at a significantly lower rate than their continuing-generation peers. These differences can occur for a variety of reasons, including students dropping out because they are hesitant to accumulate more loan debt or other academic or social factors.

This finding does align with prior research in that the association between loan accumulation and persistence is often mixed. Some studies discussed a positive relationship between loan accumulation and persistence while others revealed that debt accumulation led to lower rates of persistence to graduation (Campaigne & Hossler, 1998). Because of these mixed findings, the relationship between loan accumulation and persistence with first-generation status is an area that should be explored in future research.

Employment. The third educational outcome examined in this study was employment outcomes for first-generation students and their continuing-generation peers. The three models predicting employment for first-generation students were very poor predictors of employment at graduation accounting for only 3% of the variance in each model. This is likely because the same predictors examined in this model were examined as independent variables in the models examining graduation and loan debt. There were also small numbers of students seeking employment at the time the survey was

administered partly because of how employment was defined. First-generation status was not shown to be a significant predictor of or detractor from employment in any of the models. In fact, the only three significant predictors found were initial attendance pattern (which is likely associated with degree completion), attainment of a bachelor's degree, working while in college, and cumulative GPA. The finding that employment rates were similar for first-generation and continuing-generation students mirrors the findings of Nunez and Cuccaro-Alamin (1998). The findings do contradict those of Thomas and Zhang (2005) who found that first-generation students earn less than their peers. In this study, the average salary for all definitions of first-generation and the overall average salary for all students in 2009 were all roughly $18,000.

For students, these results are promising. If a first-generation student does persist to graduation, they are just as likely as their peers to secure employment and do so at a rate comparable to their continuing-generation peers. While this model does account for a small amount of variance, the finding that first-generation status is not a significant predictor of whether or not students are employed after graduation demonstrates that these students are able to achieve the educational outcome of employment at a rate very similar to that of their continuing-generation peers.

First-Generation Student Debt

One intent of this study was to explore the debt to income ratio of first-generation students compared to that of continuing-generation students. Because of the low amount of variance accounted for in the model and because of the challenges in obtaining normality and interpreting the results, the regression models associated with research question two were not analyzed in detail. Because of these issues, it will be important to

further consider research question two in future research. However, descriptive statistics were explored in this study to begin to answer some of the questions surrounding first-generation students' debt to income ratio. As noted in research question one, all definitions of first-generation had more loan debt than their peers when students carrying zero debt were included. This amount was approximately $2000 more loan debt for each definition of first-generation than the overall average of the sample. This is half of the difference that was noted by Engle and Tinto (2008) where the difference was $4000; however, Engle and Tinto considered students who identified as both first-generation and low-income, which is likely to account for that difference. When descriptive statistics excluded students with zero debt, the average amount of loan debt leveled out around $19,000 for all definitions of first-generation and the overall sample average.

All categories of first-generation students included a higher percentage of individuals carrying debt with over 70% in each category of first-generation carrying debt, compared to 62% of the overall students included in this study who carried debt. The promising finding regarding debt was that first-generation definition one had an average of 8% debt to income ratio, while first-generation definitions two and three as well as the overall average had a 9% debt to income ratio. These data did not include data from students who were still enrolled in college, so their debt is not accounted for. The average debt to income ratio for first-generation two, three, and the overall sample average is very close to the recommended debt to income ratio of 8% (Baum & Schwartz, 2005; Gross, et al., 2009; Scherschel, 1998). It is promising that those students who graduate do so with similar levels employment and similar salaries regardless of generational status. The unfortunate aspect is that first-generation students have larger

amounts of debt than their continuing-generation peers.

While first-generation students are the primary focus of this study, most of the research in the literature review regarding student loans explored low-income students and noted that this particular group of students is loan averse (Burdman, 2005; Campaigne & Hossler, 1998; Engle & Tinto, 2008; Lohfink & Paulsen, 2005; Lundberg, et al., 2007; Somers, et al., 2004).

Interaction Variables

First-generation and Underrepresented Interaction

In addition to examining first-generation status on its own in terms of impact on the educational outcomes of bachelor's degree attainment, cumulative loan debt, and employment, first-generation status was also examined in terms of how its interactions with other variables, specifically race/ethnicity and income, impact the same educational outcomes. Findings revealed no significant three-way interactions between first-generation status, race/ethnicity, and household income. Findings did suggest that individuals identified as both underrepresented in terms of race/ethnicity and first-generation according to any of the three definitions were less likely than their peers to graduate. The finding that first-generation, underrepresented students persist to graduation at lower rates mirrors the findings of Ishintani (2006) and McCarron and Inkelas (2006). This finding reiterates the need to correct the inequities present in the higher education setting, including disparities for low-income individuals, underrepresented students in terms of race and ethnicity, and subgroups such as adult and community college education.

First-Generation and Income Interaction

The interaction between household income and first-generation status further illuminated inequities in higher education. While low-income students had greater cumulative loan debt no matter what their first-generation status, first-generation definitions one and two who had lower household incomes had greater levels of loan debt than their continuing-generation peers and this gap increased as continuing-generation household income increased. This finding is similar to that of Ekstrom, et al. (1991) who found that low socioeconomic status individuals were the most likely to have educational debt; however, Ekstrom, et al. did not consider first-generation students as a variable. Campaigne and Hossler (1998), Engle and Tinto (2008), Lohfink and Paulsen (2005), Lundberg, et al. (2007), and Somers, et al. (2004) all reported that low-income students were loan averse; however, as with Ekstrom, et al., these studies did not specifically consider an interaction variable between first-generation and household income status. This study did consider such an interaction variable for each definition of first-generation and found that first-generation students were more likely to have loan debt if they had lower household incomes. This was true for each definition of first-generation with the exception of first-generation definition three where no significant interaction was found.

Burdman (2005) found that first-generation and low-income students were less likely to take on debt and that these students would be more likely to drop out of college rather than incur debt. Students in this study were not asked specifically if they were loan averse, so we cannot make the assumption that they are or are not in terms of their attitude toward loans. However, we do know that all definitions of first-generation students with lower household incomes are more likely to have loan debt than their peers,

so in terms of their behavior, these students do not appear to be loan averse, and it appears that they are willing to take on this type of financial aid in order to pursue a college education.

Other Findings

Contrary to prior research, there was not a significant relationship between an individual's household income and first-generation status with bachelor degree attainment in this study (Engle & Tinto, 2008; McCarron & Inkelas, 2006). This may be because household income was a continuous variable in this study whereas Engle and Tinto coded low-income as a dichotomous variable with individuals having a household income of less than $25,000 considered as low-income students. McCarron and Inkelas also considered household income in a different way than it was coded in this study and instead used a composite variable with four socioeconomic quartiles. In future studies, it would be interesting to use the same dataset that was used in this study to see whether a significant relationship exists between an individual's household income and first-generation status with degree attainment if household income is coded as low or not.

Extending the Literature

While many of the findings in this research are not new, including those that show first-generation, underrepresented, and/or low-income students attaining a bachelor's degree at a lower rate than their peers, this study does make the following contributions to the existing literature: loan aversion information; a first-generation definition; and employment as a means of measuring social mobility.

Loan Aversion

Burdman (2005), Campaigne and Hossler (1998), Engle and Tinto (2008), Lohfink and Paulsen (2005), Lundberg, et al. (2007), and Somers, et al. (2004) each reported that students at lower income levels tend to be loan averse. While this study did not explore loan aversion for low-income individuals specifically, findings did reveal that all students, regardless of underrepresented status, have higher amounts of cumulative loan debt at lower income levels than their continuing-generation peers at higher income levels. In addition, first-generation students across all definitions have greater amounts of loan debt than their continuing-generation peers. While this is true of all three definitions of first-generation, first-generation definition one did have lower average debt than first-generation definition two and three. First-generation two and three both had approximately $1805 more loan debt than their first-generation definition one peers, which would align with the literature noting that first-generation students are loan averse. While first-generation definition one students are not loan averse as compared to their continuing-generation peers, they are more loan averse than first-generation definitions two and three.

Underrepresented students, in terms of race and ethnicity, have greater amounts of loan debt than their peers in both the first-generation and continuing-generation categories. While this would not be negative if these students secured jobs that had higher salaries than their continuing-generation peers, their average salaries are very similar to that of their peers. At the same time, first-generation students graduate at a rate significantly lower than their peers. Higher debt amounts coupled with the potential of not completing a degree can be detrimental. This demonstrates the need for greater

support in terms of scholarship, loan, and career services advising for first-generation, low-income, and underrepresented students.

First-Generation Definition

This study examined the three primary definitions of first-generation status with first-generation defined as level of parental educational attainment in an attempt to make a recommendation for a common definition of first-generation. Differences are present in terms of graduation and cumulative loan debt across the three definitions of first-generation with the regression models showing that the broadest definition of first-generation, those individuals with parents who have not obtained a bachelor's degree, have lower odds of obtaining a bachelor degree and greater likelihood of having higher amounts of loan debt compared with their continuing-generation peers. This finding aligns with that of Soria and Gorny (2012) who stopped short of making a recommendation for a common definition, but recommended that further research be conducted first.

Based on these findings, I recommend that researchers, higher education administrators, and policy makers consider using the broadest definition of first-generation in designing and providing support programs and services aimed at serving first-generation college students. While there are differences even within the first-generation definitions, this research reveals that any definition of first-generation college students could benefit from support services designed to increase graduation rates and lower cumulative loan debt.

By using the broadest definition of first-generation, we can have research findings that are comparable. Colleges, national survey administrators, policy makers, and

researchers currently use three definitions of first-generation, and these findings are assumed to be comparable as all are using the term first-generation. However, findings are not comparable as long as three definitions are used. Thus, I highly recommend the use of a common, broad definition of first-generation so that the largest number of students who could receive benefits from additional service can have access to these services and so that research on first-generation students can have more meaningful results, as everyone will be using the same definition.

Social Mobility

Although first-generation students access higher education and graduate at a lower rate than their continuing-generation peers, this study examined whether a bachelor's degree narrowed the gap between first- and continuing-generation students in terms of employment. This was examined through the lens of social mobility theory. In this study, social mobility was conceptualized in terms of whether first-generation students were employed at rates similar to their continuing-generation peers. While extensive literature revealed that first-generation students tend to have lower household incomes and graduate at lower rates than their peers, this study conceptualized gains in terms of social mobility if first-generation students attained jobs at a similar rate with similar salaries to their first-generation peers.

This study considered whether first-generation students obtained viable employment at the time of graduation with a debt level comparable to their continuing-generation peers as a means of measuring social mobility. While this does not measure mobility over time, this research did demonstrate that, of the students who graduated in this 6-year study, all definitions of first-generation status and their continuing-generation

peers obtained similar levels of employment with very similar salaries. In as much as employment can be considered a means to gain social mobility, first- and continuing-generation students were comparable.

When the debt to income percentage was considered in terms of monthly loan payment versus monthly salary, first-generation students and continuing-generation students in this study had monthly debt of between 8 and 9%, which was similar to their continuing-generation peers. While the loan payments as a percentage of monthly debt are similar, many factors come in to play, including the type of repayment plan selected. However, this study reveals that although students are on a very similar playing ground in terms of debt percent and employment, first-generation status is not a significant factor in employment; all definitions of first-generation students on average still had a higher amount of cumulative loan debt at the time of graduation.

While the level of disparity evident in the gap in graduation rates does shrink in terms of amount of cumulative debt and employment between first- and continuing-generation students, on average, first-generation students do not appear to gain social mobility through postsecondary education. For those students who do persist to graduation, it would be interesting to study lifetime earnings to see whether social mobility is gained over time. It would also be interesting to see how this impacts social mobility for the children of first-generation graduates as the literature noted an individual's social status is largely inherited (McNamee & Miller, 2014). This shows that there is still much work to be done by higher education to support these students in persisting to graduation and securing the greatest amount of grant aid possible.

Limitations of the Study

Several limitations of this study must be considered. In question two, when the debt to income ratio was considered as the outcome variable, 49% of the students had a zero debt to income ratio. Because this outcome variable was considered including zeros, the effect sizes became too small to interpret. In addition, first-generation status was not significant in these models, so they were excluded from the study's results.

Because 49% of students had no loan debt, the cumulative loan outcome models had a normal distribution when excluding those individuals with zero loan debt; however, to gauge the full picture of student loan debt and to see if this research aligns with prior research stating that first-generation students are loan averse, I ran the model including zeros recognizing that this violates the assumption of normal distribution. This is a limitation of the study in that the normal distribution assumption was violated; however, I believe this provided a clearer picture of loan debt accumulation for all students instead of just those students who took on debt.

Because archival data from a preexisting survey was used, the dataset did not provide a variable considering sibling college attendance, which McCarron and Inkelas (2006) found could make a difference in the cultural capital a student has when going to college. Another variable that would be interesting to include in future studies is the attendance of other family members including cousins. This study also did not account for the lifetime earnings of participating students. Therefore, the true debt to income ratio cannot be calculated over time and instead is reported only at the time of graduation. The omission of these variables could have caused unintentional omitted variable bias, which occurs when one or more causal factors are left out of the model. The exclusion of these

variables created a limited interpretation of social mobility as a true way to gauge social mobility would be to see if first- and continuing-generation students have similar levels of lifetime income. While this cannot be determined for certain at this time, it could be explored in future research.

Exploring a dichotomous, low-income variable such as Pell eligibility or poverty level in future research could provide a more in-depth look at how low-income students differ from their higher income peers and how this impacts the models and interactions considered in this study as this study only considered household income on a continuous spectrum. To fully explore the relationship between low-income students, underrepresented students in terms of race and ethnicity, and first-generation students, a low-income variable should be included in future studies.

The models considering cumulative loan debt and employment did not account for a very large amount of variance in this study. This could be corrected with the inclusion of additional variables such as unemployment rates, major, geographical location, and even institutional prestige. In regard to employment, qualitative data would also be helpful to gather, as many factors leading to employment are personality based as opposed to being characteristics that can be captured in a quantitative study.

However, even with these limitations, this study presents important findings. This study confirms the findings of prior research, which stated that first-generation students, no matter the definition, do not achieve the same levels of success in terms of the educational outcomes outlined in this research with the exception of employment opportunities. This brings to the forefront the need for a broader definition of first-generation students. This research presents some important findings regarding cumulative

loan debt between first-generation students and their peers and exciting data regarding the rate of employment after graduation for first- and continuing-generation students.

Recommendations for Further Research

The discussion above highlights several implications for the field of higher education that are discussed in the next two sections. The first section discusses four areas in which further research is warranted: (1) qualitative research exploring educational outcome attainment for first-generation, low-income, and underrepresented students and the impact of intersecting identities, (2) adding variables to the exploration of educational attainment, (3) testing this study's findings across institutional types, and (4) lifetime social mobility.

The first area in which further research is needed is the area of qualitative research. Because many of the reasons students do not persist to graduation or take on loan debt cannot be captured by quantitative figures, additional research in this area would be of benefit. This is not to say that this type of research does not already exist; however, combining qualitative and quantitative approaches in a mixed methods research study would illuminate how statistics in terms of student graduation and loan accumulation can be combined with student stories and lived experiences to explain why these gaps exist. These stories would illustrate why some students take on loan debt while others do not even when they are at the same income level.

As has been noted throughout this study, additional variables could strengthen the models in this study. These include adding a factor for sibling educational attainment to explore whether the impact of sibling attainment or the attainment of other family members mediates the influence of parental education for first-generation students.

Considering factors such as major, residency status, whether a student lives on campus, geographic location of the campus, and whether a student changed his or her major could also increase the variance accounted for by the models and further help explain the gaps in educational attainment. Including a variable that accounts for Pell eligibility or poverty level would enhance the story told about low-income students and would likely impact the interactions explored between first-generation status, underrepresented race and ethnicity, and household income. Along these same lines, including a variable for whether or not a student received financial aid and another variable for the type of aid received are also important considerations for future studies. Finally, this study considered employment as an outcome variable, but to account for a greater percentage of postgraduate plans, individuals pursuing graduate school could also be considered.

The third area for future research is whether the findings presented in this study are consistent across college type. This study explored public, four-year institutions and did not consider the private, nonprofit, or community college experience. The study also did not consider institutions that grant both 2- and 4-year degrees to see whether any differences occur in that type of institution. Students select institutions for a variety of different reasons, and it would be interesting to explore how students' characteristics differ and how educational outcome attainment changes based on institution type.

The final area of additional research to consider is lifetime social mobility. This study very tangentially explored social mobility in terms of bachelor degree attainment, loan accumulation, and employment after graduation. While first-generation students are employed at similar rates with similar salaries, these students did not experience social mobility to a large extent because they still had greater amounts of loan debt and

graduated with degrees at a much lower rate than their continuing-generation peers. In future research, it would be interesting to see whether first-generation students do eventually attain a degree but over a long 8- or 10-year period. These students may not experience such a large gap in attainment over time as it may take them longer than the 6 years included in this study to complete their degrees. Future research could examine the impact of first-generation status on graduates, no matter how long it takes them to graduate, and on their children's educational outcome attainment.

Implications for Policy and Practice

In addition to informing an agenda for future research, this study also has implications for policy and practice. The three primary implications for policy and practice include policy implications for the following: (1) students; (2) colleges and universities; and (3) the field of higher education.

Students

Findings from this study reveal that students could benefit from use of the broadest definition of first-generation, which aligns with the definition of first-generation student used by federal TRiO programs. While differences do lie within the varying definitions of first-generation, it appears that students within all three definitions could benefit from additional support services. As such, I strongly recommend that first-generation definition three, that neither parent nor guardian has completed a bachelor's degree, be adopted for use by postsecondary institutions, researchers, and policy makers.

Having one consistent definition will ensure that we are providing services for those students who can benefit from the additional support. This consistent, broad

definition will also ensure that we are able to replicate studies considering first-generation students and that all federal and institutional programs are using the same definition. Students will benefit from this broader definition of first-generation in terms of expanded services.

Students can also benefit from the findings of this study through the development of additional student loan counseling, especially if entrance counseling is refined to include a portion where students can estimate their salaries based on major and expected debt. This will allow them to fully explore the potential benefits and consequences of taking on loan debt in order to persist to graduation. If a student is hoping to gain social mobility in terms of achieving a degree, knowing their potential debt to income ratio at the time of graduation is essential.

Students can also benefit from additional conversations surrounding the intersectionality of identities. While this research has primarily focused on the educational outcomes of first-generation students, the intersectionality of race and ethnicity with income and first-generation status was briefly explored and it is evident that these students can also benefit from additional support mechanisms. Creating safe spaces on campus where students can discuss these identities in terms of personal growth but also in terms of what support systems can be refined or expanded to ensure that these students are able to graduate in a timely manner and attain social mobility is essential.

Colleges and Universities

These findings of this study can also inform financial, academic, and career advisors' creation of workshops and advising strategies aimed at assisting students in taking on manageable loan debt and choosing careers that will allow them to pay back

loans in a timely manner. While the debt to income percentages for first- and continuing-generation students were similar in this study, the average was 9% instead of the recommended 8% manageable debt for all but one of the first-generation definitions considered, so additional refinements in advising strategies could help the overall debt to income percentage across categories.

On campuses, admissions officers and advisors should also broaden their definition of first-generation students, if they have not already, to include all students whose parents did not attain a bachelor's degree. This will allow programs and services to accurately capture data on and work with first-generation students who can derive the greatest benefit in terms of social mobility through targeted interventions.

Colleges and universities can use this broader definition to track the success of cohorts of students in order to gather information regarding successful interventions. This same principle can be applied to examining cohorts of students with intersecting identities to ensure that support programs and services are helping these students persist to graduation.

Field of Higher Education

The final policy recommendation relates to the field of higher education. In addition to the initiatives discussed above, the field of higher education can benefit from two primary recommendations: the use of a broad definition to ensure that studies are comparable and the revision of federal financial aid policies.

Currently, research involving first-generation students is inconsistent in the definition of first-generation used. The studies will use only one of the three definitions and oftentimes, will not even specify the definition used in the study. This can cause

inaccuracies in the replication of studies as well as the interpretation as when three different definitions are used across the literature, the results are not generalizable to all definitions of first-generation. The use of the broadest definition of first-generation will create consistency in the design, interpretation, and replication of studies exploring first-generation college students.

In addition to creating consistency in first-generation research, the field of higher education can also benefit from the revision of financial aid policies in terms of entrance counseling when students apply for student loans. In order to educate students in terms of the benefits and consequences of loan debt, entrance counseling for student loans should be greatly expanded. Entrance counseling could include discussion items such as amount of loan debt compared to an individual's employability and salaries for different majors. This would require a lot of work on the front end to allow for a student's entrance loan counseling to be individualized; however, the benefits over time could greatly outweigh the initial input costs.

Rather than the general entrance counseling that students now completes online before securing federal loan debt, they could see how they would personally be affected by the amount of loan debt they plan to incur with the average national or statewide salary of jobs in their field or career path. Students could then have the opportunity to manipulate the formula by selecting different career paths or fields and/or change the amount of debt they wanted to take out. As an outcome of these manipulations, students could see their debt to income ratio based on the estimations, average monthly payments (based on the different repayment plan types), and develop a monthly budget sheet to calculate the rest of their monthly expenses. While there would need to be disclaimers

about potential changes based on the type of job a student actually secures as well as information regarding how estimated loan payments are not actual, a program such as this would allow students to make better informed decisions regarding student loan debt as opposed to utilizing a one size fits all model of loan counseling.

Conclusion

The myth of the meritocracy is a reality. While this study indicates that first-generation students do eventually break even with their continuing-generation peers in terms of employment, up until that point with graduation and debt, they are not equal at all. For low-income first-generation students, this difference is even more pronounced. While debt to income ratio was not calculated in terms of variable differences, we do know that a greater percentage of first-generation students concur and have higher amounts of debt than the overall average. The literature cited above confirms this widening gap; individuals from higher income and continuing-generation families have higher graduation rates and lower levels of debt than first-generation and low-income families (Cabrera, et al., 2012; Chen & Carroll, 2005; Engle & Tinto, 2008; Ishintani, 2006; McCarron & Inkelas, 2006; Warburton, et al., 2001). This study takes one more step in refining our services in higher education to ensure greater levels of success in terms of postsecondary educational outcomes by suggesting the use of a broader definition of first-generation college students and suggesting the need for interventions to reduce loan debt for first-generation students. This study also suggests areas in which additional research can be conducted in order to more thoroughly explore variables that can lead to success. Individuals working in institutions of higher education and policy makers designing initiatives aimed at helping students persist to graduation have an

obligation to ensure greater levels of equity across higher education where all students, whether they are first-generation, low-income, or underrepresented in terms of race and ethnicity, have the same likelihood of success in terms of educational outcome attainment.

APPENDIX A

ASSUMPTIONS

Normality

To test for normality, a histogram of cumulative loan was run. As is seen in Figure 12, cumulative loan is normally distributed with the exception of those students taking on zero debt. While the distribution was still non-normal and this will be noted in the limitations, I believe that this will provide the most accurate view of the relationships between first-generation status and loan debt.

In order to test for normality excluding zeros, a Shapiro Wilk test was conducted as can be seen in Figure 13. As the test was found to be significant, it was determined that normality was present when those with zero debt were excluded.

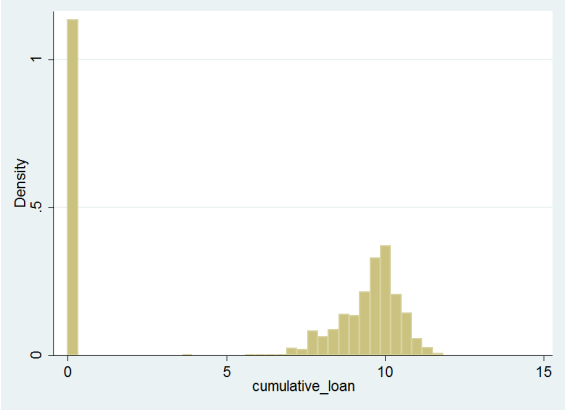

Figure 12. Histogram of cumulative loan debt. This figure demonstrates the distribution of cumulative loan debt for all students.

```
. swilk res

                    Shapiro-Wilk W test for normal data

    Variable |   Obs        W           V        z       Prob>z
-------------+--------------------------------------------------
         res |  4631    0.73374     673.755   17.048    0.00000

.
```

Figure 13. Shapiro-Wilk test. This figure tests for normality in the dataset.

Multicollinearity

To check for multicollinearity, a variance inflation factor (vif) test was conducted as shown in Figure 14. As no variables were greater than 10, it was determined that multicollinearity was not present. Running a correlation matrix allowed for the model to be checked further for multicollinearity. In this study, each of the correlations was below .5, so this assumption was met.

Homoscedasticity

The assumption of homoscedasticity was checked using a plot of the fitted values versus the residuals. The plot of the values is found in Figure 15. With thousands of observed instances, there is some clustering in the center with one noted outlier. This could be noted as a small violation of homoskedascity.

To further examine heteroskedascity in the data, the Breusch-Pagan/ Cook-Weisberg test was run to check if the residuals' variance was homogeneous and is shown in Figure 16. The evidence below shows that the null hypothesis can be rejected. As there were no serious violations present, no further corrections were made to the data.

```
. vif

    Variable |       VIF       1/VIF
-------------+----------------------
       hsgpa |      1.40    0.713920
         age |      1.37    0.730138
bachelorde~e |      1.26    0.794127
cumulative~a |      1.19    0.842983
     cincome |      1.18    0.851014
underrepre~d |      1.09    0.918206
    pareduc2 |      1.08    0.922790
    TUITION2 |      1.08    0.930144
initial_at~e |      1.06    0.946419
       asian |      1.03    0.969722
      female |      1.02    0.978513
-------------+----------------------
    Mean VIF |      1.16
```

Figure 14. Variance inflation factor test. This figure details the vif test for multicollinearity.

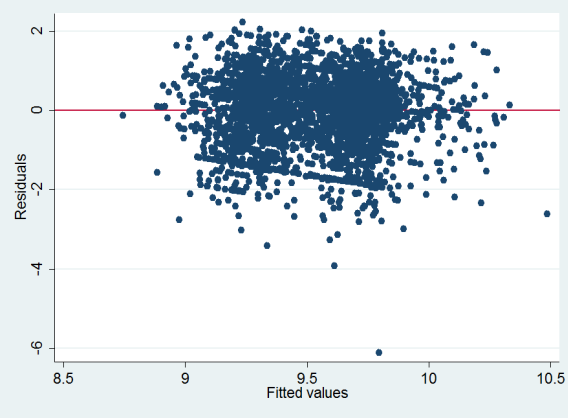

Figure 15. Scatterplot of dataset. This figure details the fitted values compared to the residuals.

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of cumulative_loan

         chi2(1)      =     8.72
         Prob > chi2  =   0.0031
```

Figure 16. Breusch-Pagen / Cook-Weisberg test. This figure demonstrates a test for heteroskedasticity.

APPENDIX B

FULL MODEL RESULTS

Table 20 Bachelor Degree Attainment First-Generation Definition One Initial Table

Variables	***b***	***se***	***z*-value**	***p*-value**	**Odds ratio**
Hours worked in college	-0.02	<.001	-8.81	<.001	0.98
Cumulative loan debt	<.001	<.001	5.47	<.001	1.00
Female	0.29	0.07	4.07	<.001	1.34
Underrepresented	-0.33	0.09	-3.94	<.001	0.72
Initial attendance pattern	0.58	0.11	4.49	<.001	1.61
High school GPA	1.06	0.06	9.03	<.001	1.78
Cumulative GPA	1.06	0.05	20.65	<.001	2.9
Tuition	<.001	<.001	6.98	<.001	1.00
Household income	<.001	<.001	6.83	<.001	1.00
First-generation definition one	-0.27	0.09	-2.31	0.02	0.81
Observations	4582				
Pseudo R^2	0.2				
Intercept	-3.23				

Table 21 Bachelor Degree Attainment First-Generation Definition Two Initial Table

Bachelor Degree	***b***	***se***	**z-value**	**p-value**	**Odds ratio**
Hours worked in college	-0.02	<.001	-8.63	<.001	0.98
Cumulative loan debt	<.001	<.001	5.64	<.001	1.00
Female	0.3	0.07	4.15	<.001	1.35
Underrepresented	-0.33	0.09	-3.92	<.001	0.72
Initial attendance pattern	0.48	0.11	4.52	<.001	1.62
High school GPA	0.58	0.06	9.02	<.001	1.78
Cumulative GPA	1.06	0.05	20.56	<.001	2.89
Tuition	<.001	<.001	6.89	<.001	1.00
Household income	<.001	<.001	6.37	<.001	1.00
First-generation definition two	-0.3	0.08	-3.91	<.001	0.74
Observations	4582				
Pseudo R^2	0.21				
Intercept	-3.15				

Table 22 Bachelor Degree Attainment First-Generation Definition Three Initial Table

Bachelor Degree	***b***	***se***	**z-value**	**p-value**	**Odds ratio**
Hours worked in college	-0.024	0.003	-8.4	<.001	0.98
Cumulative loan	<.001	<.001	5.8	<.001	1.00
Female	0.3	0.07	4.25	<.001	1.36
Underrepresented	-0.32	0.09	-3.79	<.001	0.72
Initial attendance pattern	0.49	0.11	4.58	<.001	1.63
High school GPA	0.58	0.06	9.07	<.001	1.78
Cumulative GPA	1.06	0.05	20.53	<.001	2.89
Tuition	<.001	<.001	6.77	<.001	1.00
Household income	<.001	<.001	6.05	<.001	1.00
First-generation definition three	-0.36	0.08	-4.47	<.001	0.7
Observations	4582				
Pseudo R^2	0.21				
Intercept	-3.1				

Table 23 Cumulative Loan at Graduation First-Generation Definition One Initial Table

	b	***se***	***t*-value**	***p*-value**
Age	-0.084	0.023	-3.57	<.001
Female	0.161	0.135	1.19	.233
Hours worked in college	0.021	0.005	3.99	<.001
Underrepresented	0.488	0.167	2.91	.004
Asian	-1.619	0.291	-5.56	<.001
Initial attendance	0.657	0.208	3.16	.002
High school GPA	0.163	0.137	1.19	.233
Cumulative GPA	0.293	0.101	2.92	.004
Tuition	<.001	<.001	4.55	<.001
Household income	<.001	<.001	-13.78	<.001
First-generation definition one	0.860	0.176	4.90	<.001
Bachelor degree attainment	0.022	0.157	0.14	.891
Observations	4582			
Intercept	6.68			
R^2	0.08			
Model *F*-statistic	32.61	***		

Note: *p*-value < .001 ***, .01 **, .05 *

Table 24 Cumulative Loan at Graduation First-Generation Definition Two Initial Table

	b	***se***	***t*-value**	***p*-value**
Age	-0.086	0.023	-3.72	<.001
Female	0.136	0.135	1.01	.313
Hours worked in college	0.019	0.005	3.72	<.001
Underrepresented	0.473	0.166	2.84	.004
Asian	-1.581	0.290	-5.46	<.001
Initial attendance	0.637	0.207	3.09	.002
High school GPA	0.167	0.136	1.23	.219
Cumulative GPA	0.308	0.100	3.08	.002
Tuition	<.001	<.001	4.71	<.001
Household income	<.001	<.001	-12.69	<.001
First-generation definition two	1.279	0.151	8.46	<.001
Bachelor degree attainment	0.066	0.156	0.43	.671
Observations	4582			
Intercept	6.38			
R^2	0.09			
Model *F*-statistic	36.88	***		

Note: *p*-value < .001 ***, .01 **, .05 *

Table 25 Cumulative Loan at Graduation First-Generation Definition Three Initial Table

	b	***se***	***t*-value**	***p*-value**	
Age	-0.079	0.023	3.43	.001	
Female	0.120	0.135	0.90	.371	
Hours worked in college	0.018	0.005	3.43	.001	
Underrepresented	0.451	0.166	2.71	.007	
Asian	-1.527	0.289	-5.28	<.001	
Initial attendance	0.622	0.206	3.02	.003	
High school GPA	0.165	0.136	1.21	.225	
Cumulative GPA	0.303	0.100	3.04	.002	
Tuition	<.001	<.001	4.90	<.001	
Household income	<.001	<.001	-12.21	<.001	
First-generation definition three	1.282	0.144	8.92	<.001	
Bachelor degree attainment	0.085	0.156	0.54	.587	
Observations	4582				
Intercept	6.08				
R^2	0.09				
Model *F*-statistic	37.61	***			

Note: *p*-value < .001 ***, .01 **, .05 *

Table 26 Employment After Graduation First-Generation Definition One Initial Table

Variables	***b***	***se***	***z*-value**	***p*-value**	**Odds ratio**
Hours worked in college	0.01	<.001	3.11	0.002	1.01
Bachelor degree	0.30	0.12	2.53	0.011	1.35
Cumulative loan	<.001	<.001	1.85	0.064	1.00
Age	-0.02	0.01	-1.23	0.220	0.98
Female	0.02	0.10	0.18	0.856	1.02
Underrepresented	-0.10	0.12	-0.83	0.405	0.90
Asian	-0.23	0.21	-1.14	0.253	0.78
Initial attendance	0.26	0.14	1.80	0.071	1.30
High school GPA	0.05	0.10	0.47	0.641	1.05
Cumulative GPA	0.36	0.07	5.39	<.001	1.44
Tuition	<.001	<.001	-0.30	0.766	1.00
Household income	<.001	<.001	1.79	0.073	1.00
First-generation definition one	0.12	0.13	0.93	0.355	1.13
Observations	4582				
Pseudo R^2	0.03				
Intercept	1.215				

Table 27 Employment After Graduation First-Generation Definition Two Initial Table

Variables	***b***	***se***	***z*-value**	***p*-value**	**Odds ratio**
Hours worked in college	0.01	<.001	3.13	.002	1.01
Bachelor degree	0.30	0.12	2.52	.012	1.35
Cumulative loan	<.001	<.001	1.85	.065	1.00
Age	-0.02	0.01	-1.15	.250	0.98
Female	0.02	0.10	0.18	.855	1.02
Underrepresented	-0.10	0.12	-0.80	.424	0.91
Asian	-0.23	0.21	-1.11	.267	0.80
Initial attendance	0.26	0.14	1.80	.071	1.05
High school GPA	0.05	0.10	0.47	.637	1.05
Cumulative GPA	0.36	0.07	5.36	<.001	1.44
Tuition	<.001	<.001	-0.31	.757	1.00
Household income	<.001	<.001	1.72	.086	1.00
First-generation definition two	0.05	0.11	0.47	.636	1.06
Observations	4582				
Pseudo R^2	0.03				
Intercept	1.21				

Table 28 Employment After Graduation First-Generation Definition Three Initial Table

Variables	***b***	***se***	***z*-value**	***p*-value**	**Odds ratio**
Hours worked in college	0.12	<.001	3.04	.002	1.01
Bachelor degree	0.31	0.12	2.58	.010	1.36
Cumulative loan	<.001	<.001	1.76	.079	1.00
Age	-0.02	0.01	-1.17	.241	0.98
Female	0.01	1.02	0.13	.893	1.01
Underrepresented	-0.10	0.12	-0.85	.396	0.90
Asian	-0.22	0.21	-1.09	.274	0.80
Initial attendance	0.26	0.14	1.78	.075	1.29
High school GPA	0.05	0.10	0.48	.634	1.05
Cumulative GPA	0.37	0.07	5.40	<.001	1.44
Tuition	<.001	<.001	-0.24	.808	1.00
Household income	<.001	<.001	1.90	.057	1.00
First-generation definition three	0.14	0.11	1.28	.202	1.15
Observations	4582				
Pseudo R^2	0.03				
Intercept	1.15				

Table 29 Monthly Debt to Income Percentage First-Generation Definition One Initial Table

	b	***se***	***t*-value**	***p*-value**
Hours worked in college	0.006	0.003	2.31	.021
Age	-0.021	0.011	-1.91	.056
Female	-0.008	0.063	-0.12	.901
Underrepresented	-0.094	0.091	-1.16	.247
Asian	-0.231	0.141	-1.63	.102
Initial attendance	0.171	0.099	1.72	.085
High school GPA	0.155	0.064	2.40	.016
Cumulative GPA	-0.001	0.047	-0.02	.987
Tuition	<.001	<.001	3.34	.001
Household income	<.001	<.001	-5.69	<.001
First-generation definition one	0.081	0.082	0.98	.325
Bachelor degree attainment	0.353	0.079	4.47	<.001
Observations	2585			
Intercept	0.99			
R^2	0.03			
Model *F*-statistic	8.65***			

Note: *p*-value < .001 ***, .01 **, .05 *

Table 30 Monthly Debt to Income Percentage First-Generation Definition One

	b	***se***	***t*-value**	***p*-value**
Hours worked in college	0.006	0.002	2.26	.020
Age	-0.023	0.011	-2.17	.030
High school GPA	0.163	0.064	2.54	.011
Tuition	<.001	<.001	3.56	<.001
Household income	<.001	<.001	-5.67	<.001
First-generation definition one	0.072	0.082	0.88	.379
Bachelor degree attainment	0.363	0.070	5.17	<.001
Observations	2590			
Intercept	1.12			
R^2	0.03			
Model *F*-statistic	13.93 ***			

Note: *p*-value < .001 ***, .01 **, .05 *

Table 31 Monthly Debt to Income Percentage First-Generation Definition Two Initial Table

	b	***se***	***t*-value**	***p*-value**
Hours worked in college	0.005	0.002	2.12	.034
Age	-0.026	0.011	-2.16	.031
Female	-0.015	0.063	-0.24	.808
Underrepresented	-0.114	0.081	-1.41	.159
Asian	-0.221	0.141	-1.57	.117
Initial attendance	0.159	0.099	1.61	.108
High school GPA	0.158	0.064	2.47	.014
Cumulative GPA	0.009	0.046	0.20	.845
Tuition	<.001	<.001	3.44	.001
Household income	<.001	<.001	-4.84	<.001
First-generation definition two	0.317	0.071	4.47	<.001
Bachelor degree attainment	0.362	0.079	4.60	<.001
Observations	2585			
Intercept	0.91			
R^2	0.05			
Model *F*-statistic	10.3	***		

Note: *p*-value < .001 ***, .01 **, .05 *

Table 32 Monthly Debt to Income Percentage First-Generation Definition Two

	b	***se***	***t*-value**	***p*-value**
Hours worked in college	0.005	0.002	2.06	.040
Age	-0.026	0.011	-2.42	.015
High school GPA	0.167	0.064	2.62	.009
Tuition	<.001	<.001	3.67	<.001
Household income	<.001	<.001	-4.73	<.001
First-generation definition two	0.313	0.070	4.45	<.001
Bachelor degree attainment	0.379	0.070	5.41	<.001
Observations	2590			
Intercept	0.91			
R^2	0.04			
Model *F*-statistic	16.74***			

Note: *p*-value < .001 ***, .01 **, .05 *

Table 33 Monthly Debt to Income Percentage First-Generation Definition Three Initial Table

	b	***se***	***t*-value**	***p*-value**
Hours worked in college	0.018	0.005	3.43	.001
Age	-0.079	0.023	3.43	.001
Female	0.120	0.135	0.90	.371
Underrepresented	0.451	0.166	2.71	.007
Asian	-1.527	0.289	-5.28	<.001
Initial attendance	0.622	0.206	3.02	.003
High school GPA	0.165	0.136	1.21	.225
Cumulative GPA	0.303	0.100	3.04	.002
Tuition	<.001	<.001	4.90	<.001
Household income	<.001	<.001	-12.21	<.001
First-generation definition three	1.282	0.144	8.92	<.001
Bachelor degree attainment	0.085	0.156	0.54	.587
Observations	4582			
Intercept	6.08			
R^2	0.09			
Model *F*-statistic	37.61***			

Note: *p*-value < .001 ***, .01 **, .05 *

Table 34 Monthly Debt to Income Percentage First-Generation Definition Three

	b	***se***	***t*-value**	***p*-value**
Age	-0.022	0.010	-2.08	.038
High school GPA	0.160	0.664	2.50	.012
Tuition	<.001	<.001	3.50	<.001
Household income	<.001	<.001	-4.65	<.001
First-generation definition three	0.323	0.067	4.84	<.001
Bachelor degree attainment	0.367	0.069	5.29	<.001
Observations	2590			
Intercept	0.99			
R^2	0.04			
Model *F*-statistic	19.23***			

Note: *p*-value < .001 ***, .01 **, .05 *

Table 35 Cumulative Loan Interaction First-Generation Definition One Initial Table

Predictor	***b***	***se***	***t*-value**	***p*-value**
Household income	<.001	<.001	-14.06	<.001
Underrepresented	0.583	0.192	3.03	.002
First-generation definition one	0.050	0.270	0.17	.860
First-generation definition one * income	<.001	<.001	3.06	<.001
Underrepresented * first-generation definition one	-0.454	0.559	-0.81	.417
Underrepresented * first-generation definition one * income	<.001	<.001	1.64	.101
Observations	4594			
Intercept	7.09			
R^2	0.06			
Model *F*-statistic	46.09	***		

Note: *p*-value < .001 ***, .01 **, .05 *

Table 36 Bachelor Degree Interaction First-Generation Definition One Initial Table

Predictor	***b***	***se***	***z*-value**	***p*-value**	**Odds ratio**
Household income	<.001	<.001	9.59	<.001	1.00
Underrepresented	-0.47	0.09	-5.46	<.001	0.62
First-generation definition one	-0.45	0.16	-2.87	.004	0.64
First-generation definition one * income	<.001	<.001	-0.93	.353	1.00
Underrepresented * first-generation definition one	0.46	0.25	1.84	.066	1.59
Underrepresented * first-generation definition one * income	<.001	<.001	-0.09	.931	1.00
Observations	4594				
Intercept	0.15				
R^2	0.04				

Table 37 Cumulative Loan Interaction First-Generation Definition Two Initial Table

Predictor	***b***	***se***	***t*-value**	***p*-value**
Household income	<.001	<.001	-11.72	<.001
Underrepresented	0.66	0.21	3.14	.002
First-generation definition two	0.70	0.29	2.44	.02
First-generation definition two * income	<.001	<.001	2.19	.028
Underrepresented * first-generation definition two	-0.57	0.47	-1.21	.225
Underrepresented * first-generation definition two * income	<.001	<.001	1.41	.157
Observations	4594			
Intercept	6.77			
R^2	0.07			
Model *F*-statistic	53.21	***		

Note: *p*-value < .001 ***, .01 **, .05 *

Table 38 Bachelor Degree Interaction First-Generation Definition Two Initial Table

Predictor	***b***	***se***	***z*-value**	***p*-value**	**Odds ratio**
Household income	<.001	<.001	8.38	<.001	1.00
Underrepresented	-0.50	0.10	-5.26	<.001	0.60
First-generation definition two	-0.48	0.14	-3.51	<.001	0.62
First-generation definition two * income	<.001	<.001	-0.70	.487	1.00
Underrepresented * first-generation definition two	0.25	0.22	1.17	.242	1.29
Underrepresented * first-generation definition two * income	<.001	<.001	0.79	.428	1.00
Observations	4594				
Intercept	0.25				
R^2	0.04				

Table 39 Bachelor Degree Interaction First-Generation Definition Two Initial Table

Predictor	***b***	***se***	***z*-value**	***p*-value**	**Odds ratio**
Household income	<.001	<.001	7.89	<.001	1.00
Underrepresented	-0.57	0.11	-5.23	<.001	0.56
First-generation definition three	-0.42	0.13	-3.18	.001	0.66
First-generation definition three * income	<.001	<.001	-1.62	.106	1.00
Underrepresented * first-generation definition three	0.27	0.20	1.33	.184	1.31
Underrepresented * first-generation definition three * income	<.001	<.001	1.10	.273	1.00
Observations	4594				
Intercept	0.30				
R^2	0.05				

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